

THESE FORMULAS GIVE GRATIFYING RESULTS IN INFANT FEEDING



WITH MILK AND WATER
The addition of Hylac to fluid cow's milk and water results in formulas approaching natural balance.

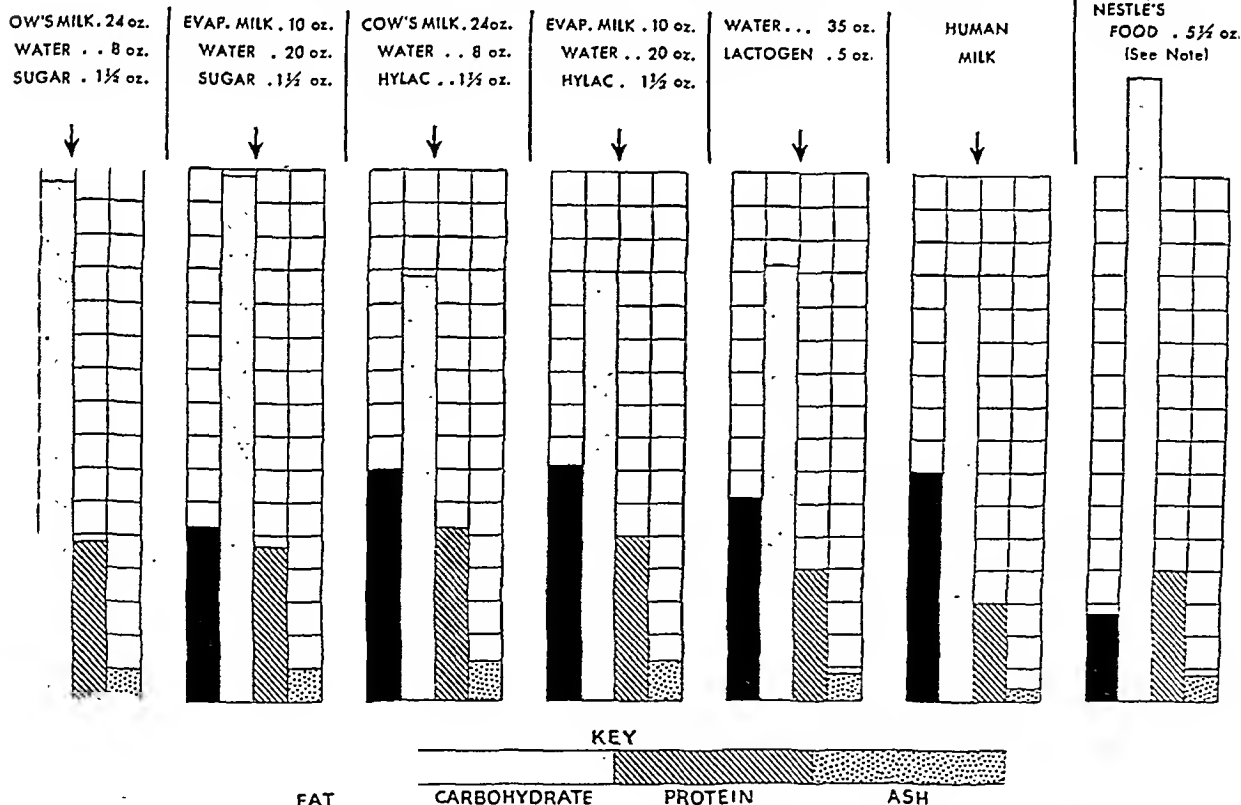


WITH WATER ALONE
A dried milk formula with all the advantages of properly modified cow's milk, plus increased digestibility.



WITH WATER OR MILK
A low fat, high mixed carbohydrate formula for infants who cannot tolerate formulas approaching natural balance.

COMPARE THESE PERCENTAGES



The above Nestlé's Food formula does not resemble human milk because it is designed for infants who cannot tolerate formulas which approach natural balance.

None of the above products is advertised to the laity. No feeding directions are given except to physicians. All three products have been accepted by the Committee on Foods of the American Medical Association. For free samples and literature mail your professional blank to:—

OBTAINABLE FROM RESPONSIBLE CANADIAN DEALERS

EOCARDYL

A solution of Bismuth Butylthiolaurate in olive oil for Intramuscular Injection

Neocardyl is prepared with view to obtaining the systematic effects of bismuth together with the advantages of water soluble salts and insoluble oily suspensions. The presence of sulphur in the molecule contributes to the smooth, gradual and complete absorption of the bismuth.

*Supplied in boxes of 6 ampoules, each
ampoule containing 1.5 c.c. of solution.*

1 c.c. Neocardyl = 0.05 Gm. of Metallic Bismuth.

A complementary sample forwarded to physicians on request.

LABORATORY POULENC FRÈRES OF CANADA LIMITED

Distributors:—

ROUGIER FRÈRES
350 Le Moyne Street
MONTREAL

SYNTHETIC" Brand Products for the Treatment of SYPHILIS

arsan (914) Powder
arsan (914) Combination
arsan (914) Solution
arsenol (606)
pharsphenamine
pholeum
tallic Bismuth
tallic Bismuth Cream
muth Oxychloride
muth Tartrate
reury Salicylate
Arsenical Poisoning
ium Thiosulphate

st producers of arsphen-
nes on the North American
Continent and the
British Empire.

Treat SYPHILIS with NOVARSAN COMBINATION (914)

A package containing an ampoule of Novarsan Powder and an ampoule of special solvent. A uniform neoarsphenamine product of the highest therapeutic activity plus a solvent which lowers the toxicity by at least one-half.

and METALLIC BISMUTH Brand "Synthetic"

Pure Bismuth metal in glucose suspension, put up in convenient rubber capped bottles. Painless—convenient—potent—economical.

Literature on request

Manufactured in Canada by

SYNTHETIC DRUG COMPANY LIMITED
243 College Street - Toronto - Canada
Midway 8055

CONTENTS CONTINUED FROM PAGE II

	Page		Page
EDITORIAL		MEDICAL SOCIETIES	
The President's Address	186	Kent County	208
The Sixty-Fifth Annual Meeting	188	Ontario County	208
EDITORIAL COMMENTS		Peel County	208
Foreign Bodies in the Air Passages	190	Peterborough	209
Sir Frederick Banting, K.B.E.	190	Canadian Branch of the British Association of Dermatology and Syphilology	209
Dr. C. F. Martin, LL.D.(Harvard)	191	SPECIAL CORRESPONDENCE	
SPECIAL ARTICLES		The London Letter	210
The Patient as a Person. <i>A. H. Gordon</i>	191	The Edinburgh Letter	210
Res Medicinæ et Civitatis. <i>E. Pope</i>	194	TOPICS OF CURRENT INTEREST	
MEN AND BOOKS		Recent Trends in Diabetes Mortality	212
Nicolas De Blegny and the First Medical Periodical. <i>A. G. Nicholls</i>	198	Blood Tests Shed Light on the Origin of Indians	213
A Living Wreath—Dr. F. N. G. Starr	202	The Doctor Prescribes Shoes	213
ASSOCIATION NOTES		ABSTRACTS FROM CURRENT LITERATURE	
The Sixty-Fifth Annual Meeting of the Canadian Medical Association	202	Medicine	214
HOSPITAL SERVICE DEPARTMENT NOTES		Surgery	217
Courtesies to the Medical Staff	205	Obstetrics and Gynæc- ology	219
PROVINCIAL ASSOCIATION NOTES		Ophthalmology	220
Alberta	206	Pathology and Experi- mental Medicine	221
New Brunswick	206	OBITUARIES	
Prince Edward Island	207	J. E. Lehmann	227
		A. W. Campbell	228
		J. E. Choquette	228
		A. B. Eadie	228
		P. V. Faucher	228
		A. W. Girvin	228
		J. H. Grant	228
		C. A. King	228
		W. A. McCracken	228
		J. P. Rankin	228
		G. A. Schmidt	228
		R. Tessier	228
		NEWS ITEMS	
		Alberta	230
		British Columbia	230
		Manitoba	230
		New Brunswick	230
		Nova Scotia	232
		Ontario	232
		Quebec	232
		General	234
		Book Reviews	236

Printed by MURRAY PRINTING COMPANY, LIMITED, 192 SPADINA AVENUE, TORONTO 2.

MAGNOLAX Absorbs Intestinal Toxins

A unique therapeutic effect distinguishes Magnolax — a stable emulsion of liquid paraffin and milk of magnesia—from ordinary laxatives and cathartics. This property makes it of supreme value in the treatment of intestinal stasis.

Magnolax absorbs and carries out of the system various harmful and putrefactive products, such as indol, phenols and other intestinal toxins.

And Magnolax does not contain phenolphthalein which may irritate the colon and cause damage to the liver in sensitive persons, especially children.

Samples of Magnolax to physicians on request.

HENRY K. WAMPOLE & CO. LTD.

Manufacturing Pharmacists

PERTH ONTARIO

PAVACODEINE

C. T. No. 301 "Frost"

R Papaverine hydrochloride..... $\frac{1}{4}$ gr.
Codeine phosphate..... $\frac{1}{4}$ gr.

ACETOPHEN AND PAVACODEINE

C. T. No. 321 "Frost"

R Acetophen.....5 grs.
Papaverine hydrochloride..... $\frac{1}{4}$ gr.
Codeine phosphate..... $\frac{1}{4}$ gr.

DEFINITE
IMPROVEMENT
IN
75%
OF
COMMON COLDS
IN FROM 24 TO 48 HOURS

*Literature and method of treatment is
presently being mailed to all physicians*

Charles E. Frost & Co.

MANUFACTURING PHARMACISTS SINCE 1899

TORONTO

MONTREAL

RICHMOND, VA.

The Canadian Medical Association Journal

The Official Organ of the Canadian Medical Association and of all Provincial Medical Associations of Canada

Editorial Office, 3640 University St. - Montreal

CENTRAL EDITORIAL BOARD

Editor, A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C).

Assistant Editor, H. E. MacDermot, M.D., F.R.C.P.(C).

Managing Editor, F. S. Patch, M.D.

Maude E. Abbott; E. W. Archibald; A. T. Bazin; F. G. Finley; A. Grant Fleming; H. M. Little; C. F. Martin;
J. C. Meakins; L. C. Simard

CORRESPONDING MEMBERS

J. W. Crane; P. C. Dagneau; N. B. Dreyer; J. G. FitzGerald; J. Miller; Ross Mitchell; Alan Rankin.

CHAIRMEN OF PROVINCIAL EDITORIAL BOARDS

ALBERTA—G. E. Learmonth, Calgary.

BRITISH COLUMBIA—C. H. Bastin, Vancouver.

MANITOBA—Ross Mitchell, Winnipeg.

NEW BRUNSWICK—A. S. Kirkland, Saint John.

NOVA SCOTIA—

ONTARIO—J. H. Elliott, Toronto.

P. E. ISLAND—J. A. McPhee, Summerside.

SASKATCHEWAN—Lillian Chase, Regina.

MEMBERSHIP including *Journal*, \$10.00. Subscription to *Journal* is \$6.00 and is limited to Libraries, Hospitals and doctors residing outside Canada. Volume commences with January and July Issues. Index in June and December Issues.

CONTRIBUTIONS

EXCLUSIVE PUBLICATION: Articles are accepted for publication on condition that they are contributed solely to this *Journal*. Arrangements for simultaneous publication may be made under exceptional circumstances.

COPYRIGHT: Matter appearing in the *Journal* is covered by copyright under the Copyright Act of 1921, but, as a general rule, no objection will be made to the reproduction in reputable medical journals of anything in these columns, provided proper credit is given.

MEMORANDUM FOR CONTRIBUTORS

MANUSCRIPTS: Should be *typewritten*, *double-spaced*, and the *original copy* submitted, otherwise they cannot be accepted.

REFERENCES: Should be arranged as follows:

In the case of a *Journal*: ROBINSON, A. L.: Exophthalmic goitre, *J. Am. M. Ass.*, 1919, 72: 1327. The black face type (72:) stands for the volume. In a typewritten manuscript the volume number should be underlined.

In the case of a book: KLEIN, *Micro-organisms of Disease*, Macmillan, London, 1st ed., 1896, p. 151.

Bibliographies are tending to become so cumbersome that frequently the *Journal* has to omit them for lack of space. Contributors are asked to give only the most important references.

ILLUSTRATIONS: Will be paid for by us when satisfactory photographs or drawings are supplied by the author. Negatives are not acceptable. Each illustration, table, etc., should bear the author's name on the back. Photographs should be clear and distinct, preferably black and on glazed paper; drawings should be made in india ink on white paper. For illustrations requiring cuts the best copper plate is used and all are printed on glazed paper. The *Journal* reserves the right to limit the number of illustrations. Contributors are respectfully requested to limit illustrations to such as are absolutely necessary.

REPRINTS: These may be ordered by contributors from the printers upon the form submitted with the galley proof.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. Advertising rates on request.

N.B.—We endeavour to exclude from our columns all unethical advertisements and appreciate notification from our readers relative to any misrepresentation.

CLASSIFIED ADVERTISEMENTS are payable in advance. To avoid delay in publishing, remit with order. Advertisements under the following headings cost \$2.00 for each insertion of 40 words or less, additional words 5 cents each.

WANTED: Apparatus, Assistant, Books, Location, Partner, Partnership, Situation.

FOR SALE: Apparatus, Practice, Sanitaria, Drug Stores.

MARMITE

(Registered Trade Mark)

YEAST EXTRACT

ITS CONTENT OF VITAMIN B

Marmite has been prescribed for some years for its potency in the Vitamin B complex; it is ordered in all conditions associated with avitaminosis B. It has been shown recently, by direct comparison of a sample of Marmite with the International Standard Vitamin B₁ preparation, that

*1 ounce of Marmite Contains
840 International Units of
Vitamin B₁*

ITS ANTI-ANAEMIC PROPERTIES

Marmite possesses a pronounced anti-anæmic factor which appears to be distinct from any of the known vitamins. It has been used with striking success in the treatment of certain anæmias.



Sample and Literature on Application to:

THE MARMITE FOOD EXTRACT CO., LTD.

Walsingham House, Seething Lane, London, E.C. 3.

or to

MacLAREN-WRIGHT, LTD., 69 Front St. East, Toronto

Canadian Distributors

In Jars: 2 oz., 4 oz., 8 oz., 16 oz. and 7 lb. tins

SPECIAL QUOTATIONS FOR SUPPLIES IN BULK TO HOSPITALS AND INSTITUTIONS

The Canadian Medical Association

Affiliated with the British Medical Association

Patron: HIS ROYAL HIGHNESS THE PRINCE OF WALES

President—J. S. McEachern, Calgary.

President-Elect—J. C. Meakins, Montreal.

Chairman of Council—G. S. Young, Toronto.

Honorary Treasurer—F. S. Patch

Editor—A. G. Nicholls

3640 University Street, Montreal.

General Secretary—T. C. Routley, 184 College Street, Toronto.

Associate Secretaries—G. Harvey Agnew, Toronto; A. Grant Fleming, Montreal.

THE COUNCIL

G. S. Young, Toronto, Chairman

J. D. Adamson, Winnipeg	R. W. L. Earle, Perth, N.B.	T. A. Lebbetter, Yarmouth	John Oille, Toronto
G. A. B. Addy, Saint John	G. S. Fahrni, Winnipeg	Geo. Lee, Shaunavon	John Palmer, Calgary
G. Harvey Agnew, Toronto	H. A. Farris, Saint John	Forrest Leeder, Victoria	F. S. Patch, Montreal
J. E. Argue, Ottawa	J. G. FitzGerald, Toronto	A. LeSage, Montreal	R. K. Paterson, Ottawa
B. C. Armstrong, Medicine Hat	A. G. Fleming, Montreal	D. Low, Regina	R. M. Pendrigh, Saint John
H. B. Atlee, Halifax	J. T. Fotheringham, Toronto	J. S. McEachern, Calgary	E. L. Pope, Edmonton
L. J. Austin, Kingston	Léon Gérin-Lajoie, Montreal	A. J. McGanity, Kitchener	R. W. Powell, Ottawa
F. G. Banting, Toronto	G. M. Gibson, Drumheller	W. H. McGuffin, Calgary	A. Primrose, Toronto
C. A. Barager, Edmonton	J. C. Gillrie, Fort William	D. W. McKay, Nelson	F. W. Routley, Maple
J. M. Barry, Saint John	Duncan Graham, Toronto	R. E. McKechnie, Vancouver	T. C. Routley, Toronto
Gordon Bates, Toronto	H. G. Grant, Halifax	J. W. McKenzie, Charlottetown	E. S. Ryerson, Toronto
W. J. Bell, Toronto	Harold Griffith, Montreal	K. G. McKenzie, Toronto	E. P. Scarlett, Calgary
J. E. Bloomer, Moose Jaw	S. E. Grondin, Quebec	Murray MacLaren, Ottawa	H. B. Small, Ottawa
R. B. Boucher, Vancouver	J. A. Gunn, Winnipeg	J. C. McMillan, Winnipeg	Emerson Smith, Edmonton
Wesley Bourne, Montreal	J. N. Gunn, Calgary	W. J. P. McMillan, Charlottetown	W. Harvey Smith, Winnipeg
M. R. Bow, Edmonton	N. MacL. Harris, Ottawa	Helen MacMurehy, Toronto	Ralph Smith, Halifax
G. S. Cameron, Peterborough	A. K. Haywood, Vancouver	Daniel McNeill, Glace Bay	G. D. Stanley, Calgary
A. B. Campbell, Bear River, N.S.	J. J. Heagerty, Ottawa	J. F. McNeill, Summerside	J. Stevenson, Quebec
P. M. Campbell, Lethbridge	V. E. Henderson, Toronto	Alex. McPhedran, Toronto	D. A. Stewart, Ninetto
H. H. Chown, Winnipeg	W. B. Hendry, Toronto	D. C. Malcolm, Saint John	G. F. Strong, Vancouver
H. H. Christie, Esterhazy	J. Hepburn, Toronto	C. F. Martin, Montreal	E. T. Tanton, Summerside
Col. J. T. Clarke, Ottawa	W. H. Hill, Calgary	J. C. Meakins, Montreal	P. H. T. Thorlakson, Winnipeg
M. G. Cody, Calgary	C. P. Howard, Montreal	H. H. Milburn, Vancouver	Ethlyn Trapp, Vancouver
R. J. Collins, Saint John	F. H. Hurlburt, North Battleford	Ross Millar, Ottawa	E. Trottier, Montreal
L. C. Conn, Edmonton	O. M. Irwin, Swift Current	B. R. Mooney, Edmonton	W. S. Turnbull, Vancouver
N. B. Coward, Halifax	F. W. Jackson, Winnipeg	E. S. Moorhead, Winnipeg	G. C. VanWart, Fredericton
H. B. Cushing, Montreal	Heber Jamieson, Edmonton	Daniel Murray, Tatamagouche, N.S.	G. J. Wherrett, Ottawa
P. C. Dagneau, Quebec	I. W. Jardine, Kensington	F. C. Neal, Peterborough	S. W. Williamson, Yarmouth
W. A. Dakin, Regina	G. R. Johnson, Calgary	A. G. Nicholls, Montreal	Ward Woolner, Ayr
V. D. Davidson, Saint John	A. S. Kirkland, Saint John	Daniel Nicholson, Winnipeg	C. F. Wyld, Montreal
C. N. DeBlois, Three Rivers	W. J. Knox, Kelowna	J. R. Nugent, Saint John	A. MacG. Young, Saskatoon
H. E. Eaglesham, Weyburn	P. H. LaPorte, Edmundston, N.B.		Geo. S. Young, Toronto
	A. D. Lapp, Tranquille		

EXECUTIVE COUNCIL

George S. Young, Toronto, Chairman	J. G. FitzGerald, Toronto	J. S. McEachern, Calgary	F. S. Patch, Montreal
A. T. Bazin, Montreal	Léon Gérin-Lajoie, Montreal	K. A. MacKenzie, Halifax	A. Primrose, Toronto
J. E. Bloomer, Moose Jaw, Sask.	Duncan Graham, Toronto	J. C. Meakins, Montreal	T. C. Routley, Toronto
	W. J. Knox, Kelowna	A. G. Nicholls, Montreal	W. Harvey Smith, Winnipeg
			C. J. Veniot, Bathurst, N.B.

Rather than the Bromides—use

BROMURAL

Alphabromisocetylurea

Council Accepted

Soothes the Nerves, Induces Refreshing Sleep

DOSE: 1 to 3 Tablets, 5 grains each.

Literature and Samples from

MERCK & CO. Ltd., 412 St. Sulpice St., MONTREAL - Selling Agents

Manufacturers: Bilhuber-Knoll Corp., Jersey City, N. J.

BRAN SUPPLIES NEEDED "BULK" FOR THE DIET

FRUITS and vegetables—and bran—are the best sources of "bulk," which helps promote elimination. But tests show that certain individuals have much of the fiber of fruits and vegetables broken down in the alimentary tract. When bran is added to their diet, elimination becomes regular again.

Laboratory investigations indicate that bran is a safe laxative food for the average person. Microscopic examination of the intestines of bran-fed laboratory animals, over a period corresponding to 30 years of human life,

failed to show any sign of injury to the intestinal tract.

Special processes of cooking and flavoring make Kellogg's ALL-BRAN finer, softer, more palatable. Except in cases of individuals who suffer from intestinal conditions where any form of "bulk" would be contraindicated, ALL-BRAN may be prescribed with safety.

This delicious cereal is likewise a good source of vitamin B and iron. Sold by all grocers in the red-and-green package. Made by Kellogg in London, Ontario.

THE *Bank* AND ITS USEFULNESS TO THE COMMUNITY

Efficiency in service, financial strength, mature experience and unwavering adherence to sound principles—these are the factors that measure the usefulness of a bank and the stability it affords to the community. ¶ The Bank of Montreal provides complete and efficient service in every department of domestic and foreign banking. ¶ Its strength is manifested in assets exceeding by \$76,000,000 its liabilities to the public—its experience and tradition by over 116 years of successful operation.



Head Office
Montreal

BANK OF MONTREAL

Established 1817

TOTAL ASSETS IN EXCESS OF \$700,000,000

A MILLION DEPOSIT ACCOUNTS DENOTE CONFIDENCE

Hysteria and Insomnia Controlled

BROVALONE

Hartz

An effectively masked solution of the active principles of Genuine Valeriana Officinalis, Hyoscyamus Niger and Rhamnus Purshiana with Sodium Bromide in a palatable and stimulating vehicle.

Effective in the treatment of the functional diseases associated with Hysteria and for Insomnia due to worry and depression. Also a valuable adjunct to tonics.

Dose: One to four fluid drachms.

Write for clinical sample.

The J. F. HARTZ CO. Limited

Pharmaceutical Manufacturers

TORONTO

MONTREAL

A modern treatment for

C O N S T I P A T I O N



FOR YOUR CONVENIENCE *and to suit the requirements of your practice, Petrolagar is now available in five types for your use in any specialized treatment of constipation or of bowel management.*

Petrolagar is dominant in successful bowel management. It is a mechanical emulsion of liquid petrolatum (65% by volume) and agar-agar, deliciously flavored and pleasant to take. It has successfully overcome the objections and disadvantages of plain mineral oil. It does not upset digestion, mixes easily with the intestinal content, acts as unabsorbable moisture and has less tendency to leakage.

LIBERAL SAMPLE SUPPLY

FREE ON REQUEST



etrolagar

PETROLAGAR LABORATORIES OF CANADA, LTD.,
103 Ottawa St., Walkerville, Ontario.

Send me Free Petrolagar (Check in Squares)

☐ Petrolagar-Plain

☐ Petrolagar with Phenolphthalein

☐ Petrolagar with C. agar

☐ Petrolagar with M. C. agar

☐ Petrolagar with S. agar

Doctor _____

Address _____

City _____

"... in my opinion none is better than Sodium Morrhuate."

(Brit. Med. Journ., June 25, 1932, p. 1,190)



The treatment of varicose veins by injection is now an accepted procedure, although the medicament employed varies according to the predilection of the surgeon; opinion appears to favour Sodium Morrhuate, experience demonstrating that *the injection is painless, the resulting sclerosis is as good as with any of the others.*

Sodium Morrhuate B.D.H. presents this medicament in an absolutely pure state; the technique of administration is simple, there are no toxic after-effects, and the injection produces sufficient irritation to cause the requisite endothelial damage.

Sodium Morrhuate B.D.H. is issued in a 5 per cent and a 10 per cent sterile solution, and it is available in ampoules and in rubber-capped vaccine bottles.

SODIUM MORRHUATE B.D.H.

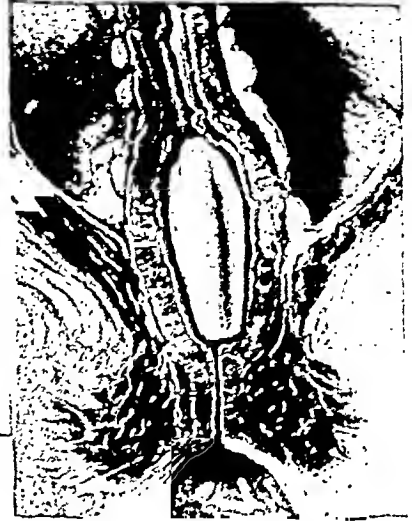
*Stocks are held by leading druggists throughout the Dominion,
and full particulars are obtainable from*

THE BRITISH DRUG HOUSES (CANADA) LTD.

Terminal Warehouse - - - Toronto 2, Ont.



ANATOMICALLY CORRECT



THE ready acceptance of WYANOIDS has been due to their effectiveness.

The rapid relief of hemorrhoidal pain, control of bleeding and promoting of healing give great satisfaction to patients.

The improved torpedo shape is easily inserted and readily retained—the formula quickly relieves pain and bleeding—the base melts evenly, liberating the therapeutic ingredients over a prolonged period—the result being an efficient and safe hemorrhoidal suppository.

WYANOIDS are packed 12 in a box.

JOHN WYETH & BROTHER, INC.

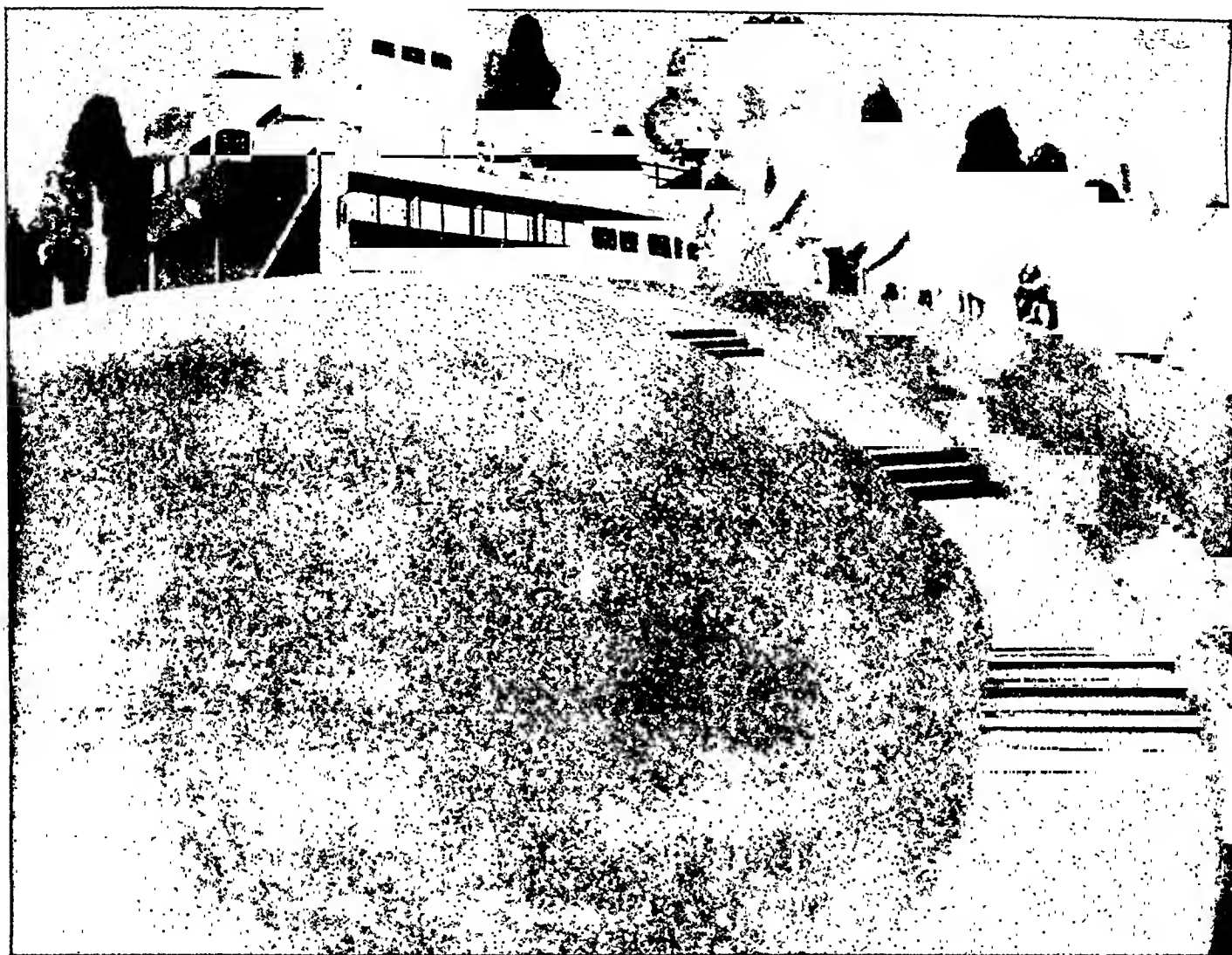
Walkerville, Ontario

WYAN • IDS

(Wyeth's Hemorrhoidal Suppositories)



One of a series of advertisements prepared and published by PARKE, DAVIS & CO., in behalf of the medical profession. This "See Your Doctor" campaign is running in the *Saturday Evening Post*, *Maclean's* and other leading magazines.



Here's something you don't see in the papers

QUIETLY, earnestly—in hundreds of laboratories all over the world—science has massed forces against one of humanity's grimmest enemies . . . *cancer*.

There is little of the spectacular about this work—little to make headlines in your daily newspaper. But as laboratory workers probe relentlessly, and as laboratory lamps burn far into the night, fresh clues are being unearthed. Patiently, these bits of evidence are being pieced together. Steadily, the store of medical knowledge on cancer is being enriched.

The goal the whole world hopes

for has not yet been reached. But important progress *has* been made. Today, cancer is *not* hopeless. Today, many forms of cancer *can* be cured.

But each of these statements is true only when qualified with a very important "IF"—that is, *if* the case is put into the hands of a trained physician in its early stages. As insignificant a period as one month can assume the importance of eternity—a cancer that might be cured today, may be beyond help in a single month.

How can one detect its early stages? The symptoms are so variable that it's futile, as well as dan-

gerous, for the layman even to attempt an accurate diagnosis. But there are warnings, of which these are outstanding: a lump that won't go down . . . a sore that won't heal . . . persistent bleeding or any other persistent unnatural discharge from any part of the body . . . persistent unexplained indigestion.

These symptoms do not necessarily mean cancer. But they're reason for suspicion; and reason, therefore, to see your doctor immediately. If it *is* cancer, the tumor can, in many

cases, be *completely removed* by surgery. In many others, it can be controlled by the proper use of x-ray or radium.

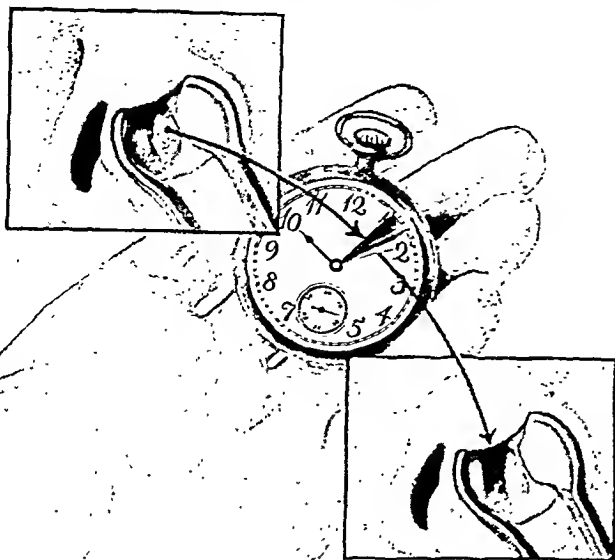
And if it *isn't* cancer, the relief that comes with banished fears and worries, will be a rich reward for doing the wise thing—for seeing your doctor when you first suspect that something may be wrong.

PARKE, DAVIS & COMPANY

Walkerville, Ont.
Montreal, Que. Winnipeg, Man.

*The World's Largest Makers of
Pharmaceutical and Biological
Products*

5 MINUTES BY THE WATCH..



Engorgement, turgescence, congestion of the nasal mucosa—quickly relieved by topical application of the new, synthetic vaso-constrictor

NEO-SYNEPHRIN HYDROCHLORIDE

(LEVO-META-METHYLAMINOETHANOLPHENOL HYDROCHLORIDE)

ACCEPTED BY THE COUNCIL ON PHARMACY
AND CHEMISTRY OF THE A. M. A.



The most recent advance in the field of vaso-constrictive agents.

ADVANTAGES OVER EPINEPHRINE OR EPHEDRINE

Untoward Systemic Symptoms Diminished
Less Toxic in Therapeutic Doses
Action More Sustained than Epinephrine
Active Each Time It Is Given • Without Sting

CLINICAL ADAPTABILITY: Promotes prompt and prolonged relief from congestion in coryza and hay fever. When combined with a solution of local anesthetic, it may be used in all types of dental and oral surgery, as well as other surgical procedures where a vaso-constrictive agent in combination with a local anesthetic is indicated.

HOW SUPPLIED: 1-oz. bottles ... 14¢ 1-oz. bottles 1¢

FREDERICK STEARNS & COMPANY OF CANADA, LIMITED
WINDSOR, ONTARIO



A New Method of Treating ANGINA PECTORIS

IN the treatment of angina pectoris, vasodilators, especially the

nitrites, have proved helpful in relieving acute attacks, but they exert only a limited influence upon the course of the disease.

Because of its prolonged action upon the coronary arteries, Myorgal, a preparation of active nucleosides, prevents the acute attacks and exerts a beneficial influence by improving the nutrition of the heart muscle.

A number of reports have been published attesting the value of Myorgal in various types of angina pectoris. It has also proved of decided benefit even in the presence of cardiac dilatation and decompensation when administered with digitalis.

OTHER INDICATIONS: Myorgal has also been recommended in the treatment of cardiac neuroses in general, sclerosis of the cerebral vessels, and the vascular disorders of the menopause when associated with anginal manifestations.

Literature on the action and therapeutic indications of Myorgal will be sent to physicians on request.

DOSE: One tablet, two or three times daily, increased if necessary.

MYORGAL

Reg. U.S. Pat. Off. and Canada

Brand of NUCLADEN

WINTHROP CHEMICAL COMPANY, INC.

907 Elliott Street West, Windsor, Ont.

Supplied in
bottles of 25 tablets



No. 5 of a Series of Advertisements Prepared in the Interest of Acetanilid B.P. by Bromo-Seltzer, Ltd.

"600,000 EYES"



for
ACETANILID B.P.

IN his recent survey undertaken for the N. F., Gathercoal found that during a one year period, doctors in the United States had written 600,000 prescriptions with Acetanilid as an ingredient, usually the main ingredient. 600,000 are not a mere handful. They constitute ample affirmation that Acetanilid is an effective and safe drug for the relief of headache. Arrayed on the side of these

thousands of doctors prescribing this efficient drug, are such authorities as Cushny, Solis-Cohen, Herz, Osborne and Fishbein, and many others. They have found Acetanilid to be . . .

Therapeutically sound as an analgesic for most forms of cephalalgia, relieving pain almost instantly . . .

That when employed in the right manner, it has no toxic effect . . .

That it is not habit-forming.

Among the 600,000 prescriptions above mentioned, many physicians used Acetanilid alone, but a great number preferred to combine it with caffeine, sodium bromide, and sodium citrate, this latter to neutralize the possible occurrence of acidity. In the Gathercoal survey 1,895,896 prescriptions were found to contain caffeine, 8,030,400 sodium bromide, and 1,150,800 sodium citrate.

Many physicians prescribing Acetanilid for headache relief average $1\frac{1}{2}$ gr. to the dose, in conjunction with $2\frac{1}{2}$ gr. phenacetin combined with caffeine and sodium bromide and sodium citrate q. s. Bromo-Seltzer contains these as the active ingredients in effervescent state.



BROMO - SELTZER LIMITED

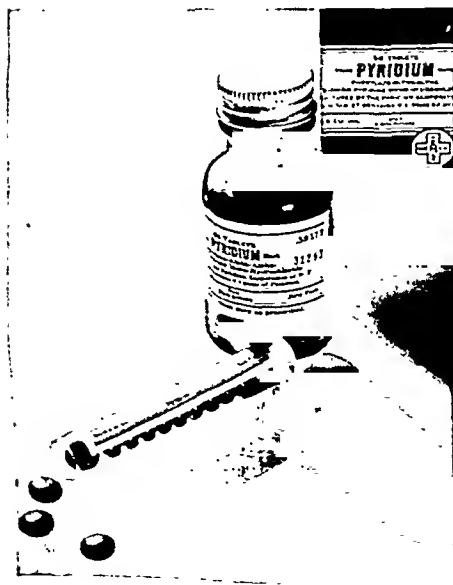
TORONTO, CANADA



TRADE **PYRIDIDIUM** MARK

PHENYLazo-ALPHA-ALPHA-DIAMINO-PYRIDINE MONO-HYDROCHLORIDE. MFD. BY PYRIDIDIUM CORP., N. Y.

"Good afternoon doctor . . . are you prescribing Pyrididium?"



IN CASE you have never given Pyrididium a trial, may we suggest that you do not delay further in taking advantage of its usefulness. It is very valuable for the alleviation of the distressing symptoms that often accompany genito-urinary infections, as well as in the treatment of these infections.

MERCK & CO. LTD.

MANUFACTURING CHEMISTS

MONTREAL

No Further Need to Lance Boils

Oral medication with STANNOXYL a valuable treatment for Furunculosis and Staphylococcal Infections.

The boil in the form of furunculosis is nothing more than a generalized eruption of boils in varying sizes. In this form it is possibly the most refractory of skin diseases, and is one in which treatment has very few active remedies.

The effect of Stannoxyl on furunculosis is most remarkable. After two days' treatment the pain usually subsides, the boils begin to dry up and those which were on the point of opening are arrested in their course. The core is not eliminated but undergoes absorption.

Supplied in bottles of 80 tablets.

*A complimentary sample sent to physicians
on request.*

ADVERTISED TO THE PROFESSION EXCLUSIVELY

THE ANGLO-FRENCH DRUG CO.
354 St. Catherine St. East
MONTREAL



FOR BURNS

OINTMENT

Butesin Picrate Ointment contains 1% Butesin Picrate. Butesin is a powerful anæsthetic and analgesic, while picric acid is well known for its antiseptic and fixing properties. Applied to burns, ulcers, lacerations and other skin lesions, pain usually disappears in a short time; infection is prevented or checked; and healing is encouraged.

ABBOTT LABORATORIES, LIMITED, MONTREAL, CANADA

The Canadian Medical Association Journal

Vol. 31

TORONTO, AUGUST, 1934

No. 2

THE PRESIDENT'S ADDRESS TO THE CANADIAN MEDICAL ASSOCIATION*

By J. S. McEachern,

Calgary

MEDICAL organization is not of modern origin. In some form it has existed in every civilized society of which history has preserved a record. No institution can survive through the ages without a definite purpose. We may reasonably postulate that the aim of medical organization is to ensure that all of the benefits which the art and science of medicine provides shall not only be available but shall be delivered to all who need them; and that in return for this service all other branches of society shall fulfil their obligations to the medical profession. Medical organization embraces a number of units, each with its special responsibility. Medical associations form but one of these. The responsibility of the Canadian Medical Association is to represent organized medicine in Canada and to effect coordination of its constituent units. How far has it succeeded in discharging its obligations?

In 1867 certain Provinces of British North America united and accepted an ideal. They agreed to cooperate in building up a nation which would have dominion from sea to sea. In the same year, a group of doctors founded the Canadian Medical Association. They undertook the gigantic task of binding together isolated sectional and provincial medical units in an organization with a national outlook. The most important of these comprised medical schools, provincial and local medical societies, provincial Colleges of Physicians and Surgeons, organized medical staffs of hospitals, and the medico-legal organizations represented by departments and boards of health. These units were not inclined to cooperate. In each of them

however, were one or more men, in active sympathy with the aims of the Association, who constituted the leaven which was to arouse a national sentiment in Canadian medicine. Over half a century was to elapse before that ideal gained general acceptance. In the darkest hours of its history, when it seemed that the labour of the preceding fifty-five years was in vain and that the Association must be disbanded, there came from every part of Canada an insistent demand for leadership in coordinating the various medical activities of the Dominion. Coincident with this demand there came a realization to hundreds of Canadian doctors that the agency which could effect this coordination was the Canadian Medical Association. It had failed, not from inherent weakness, but because they had withheld from it their assistance. To their lasting credit, they rallied to its support. Soon, its membership was numbered in thousands, rather than in hundreds. Following this renaissance, a new era opened for the Association. A full time secretary was secured in the person of Dr. T. C. Routley. He brought to his task native qualities of sterling honesty, kindly sympathy and tireless energy, and the acquired accomplishments of skilful diplomacy, and almost uncanny organizing and executive ability. With an unswerving singleness of purpose he has devoted himself to the work of serving the organized profession of Canada. To him, more than to any other individual, we owe most of what has been accomplished. I would be remiss in my duty if I did not, in passing, pay him this scant tribute.

Space does not permit of more than a cursory review of the activities undertaken and the results accomplished. Today, our Association has

* Delivered at the sixty-fifth Annual Meeting, Calgary, June 20, 1934.

nized both within and outside of the profession as the representative of organized medicine in Canada. Each provincial association appoints representatives to our Council; in the aggregate, these comprise the Council. It provides a forum in which any questions relating to the organization of medical practice may be discussed. Many diverse problems have been presented and satisfactorily dealt with. Most of them required for their solution only the mutual understanding which resulted from free discussion. In regard to some of them, we have accepted a mandate to take executive action. We have provided a Canadian medical journal of which we have reason to be proud. In response to the demand for a central clearing house for hospital problems we established and maintain a Department of Hospital Service. In order to provide post-graduate instruction in the recent advances of medical knowledge for doctors who were unable to leave their homes we organized the post-graduate lecture tours. This work is familiar to every Canadian doctor. As our contribution to the solution of the question, "What constitutes a specialist?", we have taken steps to ensure that higher degrees in medicine and in surgery shall be available to those who qualify for them by post-graduate study. Our Association sponsored the establishment of the Royal College of Physicians and Surgeons of Canada. At the same time, as a result of negotiations carried on with the Royal College of Surgeons of England, the primary examination for Fellowship in that body was for the first time held in Canada.

The benefits offered to mankind by medical discoveries can be received only by a public which has been made aware of their value and freed from prejudice against their use. We have accepted the responsibility for the program of popular health education involved in this. For some years a committee has supervised the preparation of health articles and has arranged for their release through the press and the radio. Through the cooperation of the members of the Canadian Public Health Association and our committees on pharmacy and on legislation we have succeeded in securing the enactment of legislation which protects the ignorant and credulous of the population against the dishonest vendor of proprietary nostrums. Lay organizations primarily interested in medical activities, such as the Canadian Tuberculosis

Association, the Canadian Red Cross Society, and the St. John Ambulance Association, have sought and obtained affiliation with us. The reciprocal relationship has enlarged the field of usefulness of each organization concerned.

As the representative of Canadian medicine, we have been offered the assistance of purely lay organizations. The National Research Council, through us, tendered its good offices to the medical men of Canada in an offer to measure the efficiency of equipment used for medical radiation. Those large financial institutions whose success is affected by the health and longevity of the Canadian people—the life insurance companies—have extended to us their material cooperation. For seven years the Sun Life Assurance Co. financed the post-graduate lecture program of the Association. The same Company, by an additional grant, has made possible the extension of the work of the Department of Hospital Service. The Canadian Life Officers Association has provided the funds required for the publication of health articles in the press.

The advances in medical and allied sciences in the past fifty years have enlarged the field of usefulness of the individual doctor; they have added to the perplexities of the organized profession. The number of subjects embraced in the medical curriculum has been greatly increased. A multiplicity of specialties has been developed. Numerous mechanical diagnostic aids have been devised. Startling as the idea may seem, the operation of these aids has given rise to specialties. As a result we have the radiologist, the cystoscopist, and the bronchoscopist. The simple armamentarium of the physician of fifty years ago has been displaced by complicated and expensive equipment. The application of these discoveries presented two major problems. One concerned medical education; the other affected medical practice. The first was attacked by the medical schools; the other, being nobody's business, was allowed to drift. The solution of the first demanded that provision be made for teaching many new subjects in addition to those which are still as essential as they were fifty years ago; the second required for its solution a reorganization of conditions of practice which would enable the doctor to pursue his profession according to the principles which he had been taught.

Fifty years ago the general practitioner was

given a good training according to the standards of the day, in a course of, at most, four years. Each year consisted of a session of six or seven months. As the curriculum became more loaded, the course was increased to five and then to six years. The annual session was not materially lengthened; in some schools it was increased to eight months. Six years out of the productive period of a man's life is a substantial price to pay for training in the principles of his profession. Moreover, if he is to become reasonably competent in the technical application of these principles, he must spend one or two additional years as a hospital intern. Admitting that the standard of medical education must not be lowered, is it possible to shorten this course? In six years the student receives forty-eight months of supervised training. With an annual session of ten months he could receive in five years, fifty months of supervised training. During that time, he would enjoy a much longer annual vacation than his brothers who are being trained for a commercial, mercantile, or mechanical pursuit. The year thus saved could be more profitably spent in hospital internship or in post-graduate study along some special line.

Two additional problems of medical education merit a brief reference. All provincial licensing boards now recognize the certificate of the Medical Council of Canada as evidence of an applicant's fitness to be granted a license to practise. The universities still insist that the graduating student must pass another examination before being granted a degree, although the standard set for such examination is admittedly no higher than that of the Medical Council of Canada. A serious effort on the part of the university authorities and the Medical Council of Canada to co-ordinate the work of the examining boards of each of them would result in a single examination serving the purpose of both.

Shall the number of students accepted for training in medicine be limited to the needs of the population of Canada, or shall the schools be urged to accept all applicants who comply with the present standard for admission? This is a question which demands the answer of the organized profession.

Fifty years ago the young graduate found medical practice organized in harmony with the state of medical knowledge of the day. He could practice his art, without aid, according to the principles which he had been taught. The

graduate of today goes into a world where medical practice is organized, for the most part, much as it was in the days of his grandfather. Criticize as we may excessive dependence upon laboratory aids, the well-trained conscientious practitioner stands in daily need of the help of such diagnostic aids as the bacteriological, the pathological, and the biochemical laboratory, the x-ray, the cystoscope, and the bronchoscope. But he cannot hope to acquire and maintain proficiency in the use of all of these, even if he has at his disposal the financial resources with which to purchase the necessary physical equipment. Unless he lives in a large city he cannot command the aid of specialists. The family doctor is something more than a man; he represents an institution which must be maintained if the profession of medicine is to survive. It must be admitted that the day of individualism in the scientific practice of medicine is over. Today and in the future this must be carried on along cooperative lines.

How is the necessary cooperation to be brought about? How can the system of practice be organized so that the recent graduate will not find himself placed in an impossible situation? It is our duty to provide a satisfactory answer to these questions, a solution which will be practicable under existing conditions. A number of alleged solutions are available for our critical examination. (1) It has been said that the family doctor is obsolete and that the type will soon be extinct: in the future he will be replaced by a corps of independent specialists. (2) A complete medical service provided by the state. (3) A suggestion which has been submitted to practical test is that the Provincial Boards of Health provide facilities for bacteriological, pathological, and serological diagnosis. (4) A fourth suggestion, which for many years has given rise to voluntary experiments, is that a number of practitioners band themselves together. Each one would be obliged to acquire more than average skill in some special department of medicine. His services would always be available to each of the others. Each one would continue in the traditional relationship of family doctor to those he served. By pooling their financial resources they would be able to acquire the necessary mechanical aids to all diagnosis and treatment. These groups would, in a year, in the aggregate, probably fill the many vacancies into which the present system has

be absorbed. Unfortunately, none of these suggestions, except the third, offers anything to that most heroic figure of the medical profession—the conscientious general practitioner, who works alone in an isolated rural district.

Our Association is not concerned with the partisan politics of Canada. The polity of our country however is our vital concern. We may discuss that without acrimony. Our revered Fathers of Confederation had the vision to recognize that changed conditions demanded change of methods. They had the courage to break with tradition and establish a new system. We may reasonably infer that they had faith that posterity would exhibit similar qualities. In discussing the remaining problems which one desires to examine we must be prepared to hear the shibboleth of provincial autonomy and to be reminded of our great national alibi—The British North America Act.

Analysis of the economic problems of the Canadian doctor brings to light certain facts. Two of these are worthy of present consideration. Our committee on economies has made an intensive study of the various schemes of health insurance. They have already demonstrated that under every form of health insurance yet devised the care of the sick indigent must remain the responsibility of the state. Your committee appointed in June, 1933, with instructions to interview the Prime Minister, succeeded in securing a clear-cut pronouncement. Under the British North America Act, the state delegates to each Provincial Government the responsibility for the health of the people who live in the province; the Federal Government is thus relieved of responsibility. It would seem that the Federal Government is not invested with power to ensure that the Provincial Governments shall discharge the obligations involved in the responsibility which they have accepted. With the individual, the discharge of a financial responsibility is an obligation which involves his honour. This is equally applicable to the representatives of the state. The individual who evades his financial obligations may be induced to discharge them by moral suasion or by compulsion. Most of the Provincial Governments have evaded and are evading their responsibilities.

There remain to us three options. We may philosophically accept the burden which has been unfairly laid upon us; we may leave to

the various Provincial Associations the task of applying moral suasion to the Provincial Governments; or we may invoke the only compulsion which the politician recognizes—public opinion. Is it expedient to do this? Is it consistent with the dignity of organized medicine in Canada that we endeavour to arouse a public sentiment which will compel governments to discharge their moral and legal obligations? Your answer to these questions will be your mandate to the Canadian Medical Association.

We may have honest differences of opinion in respect to the desirability of a complete state service in the field of curative medicine. We can all agree that the protection of the citizens against communicable diseases is a state responsibility. We have a right as citizens to demand that this public health service of preventive medicine shall be organized by the state so as to make practical application of the modern knowledge of sanitary science. An organization which will coordinate and correlate the activities of all the workers engaged in public health service will secure the maximum of efficiency with the minimum of expense. Conversely, an organization without central control will naturally fail to coordinate and correlate the activities of the workers; it will be expensive and comparatively ineffectual.

At Confederation, a state public health organization was established. It was in keeping with the standard of sanitary science of that day. An isolated department for each province was provided. Later a Federal Department of Health was established, which was not invested with authority to coordinate existing health departments. In the intervening sixty-seven years, sanitary science has made enormous advances. The field in which it carries on research has widened until it now embraces all forms of organic life in which bacteria may live and multiply. The development of the science of bacteriology brought into the field of public health a large number of highly trained workers. The services of many of these men have been secured by the various departments of state public health but the structural organization of the service has remained fundamentally the same as in 1867. Its lack of provision for co-ordination may be illustrated by a single concrete example. Scientific research has demonstrated that many diseases are communicable from the lower animals to man. Of these, the

diseases of domestic animals which are transmissible to man comprise a formidable list. The danger to man of such acute diseases as anthrax, rabies, and glanders, is appreciated even by the laity. The more insidious and persistent menace of chronic diseases such as bovine tuberculosis, actinomycosis, and brucella infection has not received even from the physicians the attention it merits. But diseases of domestic animals are a problem for the veterinarian. The control of contagious diseases of domestic animals comes within the purview of the State Department of Agriculture. As in the case of health, the State Department of Agriculture is represented by nine Provincial Departments and a Federal Department which is not empowered to co-ordinate the activities of the various provincial departments.

The Federal Department of Agriculture, however, has established a Health of Animals Branch. In this sub-department are employed expert veterinarians and bacteriologists. The research work carried on by these men deserves the highest commendation. When we recall that research in contagious abortion in cattle throws light upon undulant fever in man, and that every new discovery relating to bovine actinomycosis and bovine tuberculosis will simplify the task of dealing with their counterparts in the human patient, we must realize that, these men though working in the Department of Agriculture are really public health workers. If we demand of the sanitarian that he carry on an aggressive campaign to eliminate the menace of these diseases, we must provide him with machinery which will facilitate and not hamper his work. The structural organization of the public health system of Canada is not designed to ensure cooperation of the various workers engaged in public health activities. The single task represented in the satisfactory control of this group of communicable diseases cannot be accomplished without the organized cooperation of the sanitarian, the bacteriologist,

the physician, and the skilled veterinarian. It obviously requires a national organization which will not only unify the nine Provincial Departments of Health but will provide for the coordination and correlation with it of a Health of Animals Branch of the Department of Agriculture which would also have Dominion-wide jurisdiction in its own special field. The Dominion of Canada has already available the necessary means to apply to this problem all that modern science offers. It has the necessary personnel and the necessary physical equipment. Only unification of control is lacking. The health of our people is our greatest national asset; the guardianship of that asset should be in fact as well as in theory a national, not a provincial, responsibility. Have our people in the past sixty-seven years so far overcome provincialism as to be able to subscribe to that statement? If so, we should be prepared to advocate the organization of a National Department of Health which will be responsible for the administration of public health throughout Canada. At once we are confronted by the limitations imposed by our Constitution. Within the past few weeks the Prime Minister was reported to have stated in Parliament that in the near future the British North America Act must be amended. If and when this is done, the organized medical profession of Canada should be prepared to submit constructive suggestions for the organization of a public health service which would be free from the weakness of the present system.

The road which we must travel toward our goal is long and beset with difficulties and disappointments. We shall not be disheartened by them if we accept the philosophy of a wise old observer who over two thousand years ago wrote, "The race is not to the swift, nor the battle to the strong, nor yet bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill, but time and chance happeneth to them all."

GROWTH, INNOCENT AND MALIGNANT*

By WILLIAM BOYD, M.D., F.R.C.P. (LOND.),

*Professor of Pathology, University of Manitoba,**Winnipeg*

OUR object to-night is a two-fold one: first, to honour the memory of a great medical scientist and a great gentleman, and secondly, to consider a subject in which he was intensely interested. Gordon Bell's remarkable talents and brilliant qualities have been dealt with by those who have delivered this lecture on previous years, but you will allow me to touch on one or two points which used to impress me particularly. In these days when fine equipment and mechanical aids are considered essential for good work, Gordon Bell daily demonstrated that a simple freezing microtome and an old microscope were sufficient to unravel the complexities of the most puzzling of pathological tissues, and many a time has he saved me from errors into which I would have fallen had it not been for his friendly counsel. The man is everything, the equipment nothing in comparison, for the right man can adjust his problems to the equipment ready to his hand.

Another of Gordon Bell's most striking qualities was his infinite charm, which no one who knew his wonderful smile can ever forget. Part of this charm was his inimitable gift as a teller of tales. I have never known a man to whom I could so readily listen through the course of a long winter evening. No one would want to talk when he could listen to Gordon Bell. In Sir Philip Sidney's phrase, he told a tale which held children from play and old men from the chimney corner. Lord Lister once returned to Glasgow, the scene of his early triumphs in antiseptic surgery, and addressed a great meeting of medical students at the University. At the close they called for a word from Sir William Macewen, by far the most brilliant surgeon whom the Scottish metropolis had produced, and one not noted for mock modesty. For a time Macewen refused to respond, but as the cries redoubled he rose to his

feet, looked around on the great gathering, and spoke these words: "When the nightingale is singing, all the other birds are silent." Then he sat down. That was his tribute to Lister. So it was with Gordon Bell when he was at his best, as at the Namaycush Fishing Camp, or in his own laboratory. We listened, enchanted. What a gift! Hereditary, like so many other gifts, for we find it appearing again in his brilliant son. Like Ulysses he was a part of all that he had met, and all experience was an arch through which gleamed that untravelled world which his scientific curiosity drove him to explore. He was intensely interested in life, literature, nature, and *growth*, and it is to the problem of growth that I would direct your attention for a brief space to-night.

Growth is an attribute of all living things; it is the most fundamental of biological processes. This is true of the body politic as well as of the human or animal body. Cessation of growth means stagnation and, eventually, death. But do we really know what we mean by growth when we make so sweeping a statement? Analysis may show that our ideas on this subject are not as clear as we imagined. At the beginning of life growth is very rapid, then the tempo slows down, and finally growth of the body as a whole ceases, although the individual parts may continue to increase in size. The size to which an animal may grow is not determined by chance. It is more or less fixed at the time when the sperm cell gives the fertilized ovum that strange impulse to increase which constitutes the beginning of the life of the individual, fixed by what Lueretius would call "the nature of things", fixed, as we say, by the genes on the chromosomes which form the physical basis of heredity. The cell, the ovum, from which both the mouse and the elephant start is of much the same size, and the mouse cells never differ much in size from those of the elephant, but the limit of growth is soon reached in the one, long delayed in the

* The Gordon Bell Memorial Lecture, delivered to a mixed medical and lay audience at Winnipeg, May 18, 1934.

other. At one time it was thought that an organ, or the body as a whole, increased in size through increase in size of the constituents of which it was composed. We now know that this is not true. Growth takes place by multiplication in the number of the cells which form the building stones of the body, not by an increase in their size. It is true that when a cell divides into two it is at first smaller than the original cell, but the offspring soon regains the size of the parent, through absorbing nourishment from its surroundings. We therefore arrive at this conception—that the size of an animal depends on the number of its cells, not upon their dimensions. Growth is fixed. Those familiar with Lorrain Smith's delightful book, "Growth," will recognize the source of this and many of the other ideas in this address.

What, then, do we know about this all-important growth stimulus? About the primary impulse, nothing, but something about the factors which subsequently govern growth. For there is an enormous difference between growth in the earliest stages of life and growth in the later stages. In the beginning growth is sheer multiplication or reproduction. One cell divides into two, two into four, four into eight, all, as far as we can see, exactly alike. But sooner or later a very different factor begins to creep in, the factor of differentiation or specialization. Some cells are set aside to form the heart, some the brain, some the arm, and some the sex cells. Once they have started along the path of differentiation they can never retrace their steps; "not all your tears can lure them back to cancel half a line". This differentiation in the end means death, but surely that is the law of life. For differentiation inhibits growth. When cells have become completely differentiated, or specialized, growth comes to an end. Such cells cannot give rise to tumours. Red blood corpuscles, nerve cells and bone cells are examples of differentiation carried to the extreme. Strangely enough, differentiation can be prevented by removing the cells from their normal environment in the body and growing them in artificial culture outside the body, just as bacteria are grown. When this is done growth can go on freed from the restraint of differentiation indefinitely and seemingly for ever. Apparently, it is the influence of the immediate surroundings, that is, the environment, which makes for differentia-

tion, but at the same time robs the cell of its reproductive power. When the usual environment is changed the cell, like Cleopatra, feels immortal longings on it. We seem to have conferred an immortality on the tissue in the culture tube. Yet who would wish for immortality under those conditions? Life is not everything.

We have spoken of life and living substance. To define these terms is fortunately beyond the scope of the present lecture. When we look into the matter it becomes startlingly difficult to distinguish between the living and the dead. All of the substances with which we are familiar, such as iron, lime, salt, carbon, oxygen, may be either living or dead, for the living world stoops down into the inorganic world, takes it up, vivifies it, and converts it into living substance. Theoretically, the entire world of what we call dead matter could be converted into living flesh, the entire ocean might be built up into the bodies of the jelly fish which inhabit it. Who then shall say what life is? On the one hand we are dust and to dust we shall return; on the other we are "such stuff as dreams are made of".

From the point of view of medical science cessation of growth is as important as its continuance. Picture what would happen if a limb or an organ should continue to grow after the period at which growth should normally cease. The person in whom this occurred would either develop into a monstrosity, or would be killed by the excessive growth of the organ. In this transgression of the law which says "thus far and no farther" we catch our first glimpse of the dark problem of tumour growth and cancer. We think it natural that growth should stop, but in a way this is quite as remarkable as that growth should start. Instead of asking ourselves how tumours occur, we might ask—how is it that they do not always occur?

Most tissues, though they stop growing, have the power of resuming growth. Were it not so, the surgeon would be unable to continue his craft, for repair would be impossible. When a piece of the liver or the thyroid gland is cut away the loss is made good by multiplication of the cells which remain, and the original bulk of the organ is restored, although this is not true of so highly differentiated a structure as the brain. The most striking example of re-

pair is afforded by the fibrous or connective tissue which lies under the skin. In adult life this is an entirely quiescent structure with no suggestion of a power of proliferation. But let the surgeon's knife pass through it and at once, even though fifty years have elapsed since growth has ceased, the cells begin to proliferate, bridge the gap, and sew together the edges of the wound. What can this mean? Surely, only one thing; the cells must contain some growth-promoting substance which is liberated from their bodies as the result of injury, and which stimulates them to multiply until the needs of the body are satisfied. The idea of cells containing substances which can stimulate them to divide at any period of life is highly suggestive in relation to the problem of cancer.

Normal cells in adult life may show remarkable powers of multiplication, but they know when to stop. In other words, growth is restrained. Of what constitutes this restraint we have only the vaguest ideas. The needs of the tissue appear to be an important factor. In the experiment already cited, in which a piece of liver or thyroid is removed, the liver or thyroid cells proliferate until enough of the organ is formed for the needs of the animal. But in the later stages of development certain definite regulators of growth make their appearance. Of these the most important is the pituitary gland, one of the smallest organs in the body, but one which exercises a profound influence over the growth of the body as a whole. If the pituitary is deficient in function the patient remains a dwarf, and the same is true of others of the ductless glands, especially the thyroid. If the pituitary is overactive the patient becomes a giant. This amazing organ, which is only a little larger than a pea, has about half a dozen functions, one of which is to regulate growth, particularly the growth of the skeleton. It is composed of three different kinds of cells, only one of which produces the growth-regulating principle.

Not only do the connective-tissue cells of the subcutaneous tissue proliferate, the much more highly specialized epithelial cells also possess this power, otherwise the raw surface of the wound would not be covered over. As a matter of fact the skin is one of the most remarkable structures in the body. It is exquisitely soft, at least in some people, and yet it can stand an

amount of wear and tear which no brake lining would put up with. It covers everything as tightly as a glove, and yet it gives with every movement. It regulates the temperature, excretes waste products, and forms an important source of vitamine D. But to-night I would direct your attention to its manner of growth. This keeps pace exactly with the needs of the body. No matter how quickly the child may grow, his skin also grows at exactly the right rate. Now the cells on the extreme surface do not grow; they have become so specialized that they have lost the power of multiplication. There is, however, a basal layer of cells which are not differentiated, and it is in this layer that growth occurs. The newly-formed cells, as they become differentiated, are gradually pushed to the surface, where they are finally shed off as scales. Let us examine this basal germinal layer for a moment. One cell divides into two. Now if both of these became differentiated and moved to the surface there would soon be nothing left of the germinal layer. So the two new cells must differ from one another in some subtle way; one remains behind to "keep the home fires burning", whilst the other moves off to foreign fields. The same is true of the cells in the bone marrow which manufacture the circulating blood corpuscles. Of the two cells which are formed one is taken and the other is left. This is a remarkable and beautiful arrangement, but its beauty is not apparent unless pointed out. It is a principle which must hold for any tissue in which the process of differentiation is continually going on. Whether these facts have any bearing on the problem of tumour growth we do not at present know. It is possible that some day they may provide us with a method of controlling the undisciplined growth which we designate as cancer.

Another regulator of growth with which everyone is familiar is the group of food vitamins. A child brought up on a vitamine-poor diet will remain stunted all his life. The multiplication of cells which we call growth may be dependent on certain vitamins, and it is possible that here also we may in the future find a weapon with which to fight the scourge of cancer.

Let us now return to a subject which has already been touched upon, that of tissue culture. The successful cultivation of living

cells removed from the body and under artificial conditions is one of the most remarkable triumphs of modern biology. When a body dies all the cells which constitute its organs do not die at once. They live for a time, and if removed from the body and placed in a suitable medium some of them may continue to grow and multiply. It is even possible to obtain a culture of living cells from a sausage, an even more remarkable achievement than the resuscitation of the dead dog of California. Nor will this growth cease when the natural space of life of the animal from which the cells were removed is reached. Old age is evidently not a property of the cell itself, but of the environment by which it is surrounded. Alter that environment and the cells may go on multiplying for ever; the tissue has become immortal. It must be admitted that this immortality cannot be attained by adult cells, on which the finger prints of age and the sharp tooth of time have already left their mark. But when cells from the embryo are used, cells on which the deadly limits of differentiation have not yet been set, endless youth, if by that we mean boundless power of propagation, appears to be their lot. It is evident that the method of tissue culture places in the hand of the experimenter a weapon of great power, for he can observe under the simplest conditions the behaviour of growing cells in response to growth-promoting substances, to such poisons as alcohol (or perhaps we should rather say stimulants), to growth-inhibiting factors such as x-rays and radium, and so on. A moving picture can be taken of the process under the microscope, and then greatly enlarged and speeded up, and such a picture provides to the initiated a thrill which no production of Hollywood can hope to rival. One seems to be looking at the seething cauldron where nature is bringing forth new beings. It is a glimpse behind the scenes of life which for ever after gives one a new idea of living matter. Many malignant or cancerous tumours, which are essentially undifferentiated tissues, can be readily grown in culture outside the body, and it is especially in this field that the study of the action of x-rays and radium on cell growth is of the greatest value. By this method it can soon be determined that the cell which is vulnerable is that which is actively dividing, whereas in the resting or growing stage it may

be highly resistant. The varied behaviour of different tumours when exposed to radiation is also highly instructive.

And now we must ask ourselves the question: What is a tumour? What are the characteristics which distinguish tumour growth from the growth of normal cells? A tumour is not something introduced into the body from without, like a germ. It is merely a multiplication of the original cells of the part. Cancer of the liver is formed of liver cells, cancer of the skin of skin cells, and so on. Its chief distinction is autonomy. A tumour is an autonomous growth, unmindful of the tissues in which it grows and which serve to support and nourish it. The cells of an organ such as the liver are members one of another. They work in partnership. Some of the cells are resting whilst others are working, and presently the resting cells will assume full activity, whilst the former workers rest. Such is not true of tumours. They live unto themselves. A cancer may drain the life blood of a patient till he is wasted to a shadow, while it waxes gross and multiplies exceedingly. The cancer cell does not become differentiated; it is not influenced by the environment in which it lives provided it gets plenty of food; it shows no sign of senescence; it does not keep step with the normal procession of life. It therefore presents a unique biological problem, different from anything else with which we are acquainted in the world of living matter, a law unto itself.

If it can be compared with anything it is the artificial culture of embryonic tissue, which, as we have already seen, possesses the same furious capacity for growth and reproduction, with utter disregard of differentiation. At first sight it may seem that the cancer cell has been endowed with new and transcendent powers of growth, but on deeper thought it becomes apparent that the real fault may consist in a breaking down of the barriers of growth restraint, thus liberating the potentiality for growth with which most cells are endowed. It becomes evident that the solution of the problem may be provided not by a frontal assault on the tumour itself but by a study of the fundamental processes of growth and growth restraint. Just as the open sesame to the mystery of infection came from Pasteur, a chemist, and as the dark problem of the defence mechanism of the body against bacteria

was illumined by Metchnikoff, a zoologist, so the Everest peak of cancer may be sealed by a quiet worker far removed from the field of practical medicine. The endowment of research for some strictly specified and limited purpose is not the most likely method of attaining the object of the giver.

The problem has been attacked in a variety of ways, but time this evening will permit of a consideration of only one of these, the experimental production of cancer. In this work three great steps have been taken, the first two by Danish investigators, the third by a Japanese.

It was in 1902 that Jensen, in Denmark, first demonstrated the possibility of transplantation of tumours. When a piece of tumour occurring spontaneously in an animal is transplanted into another animal of the same species a new growth will develop in the second animal. Owing to the fact that the second animal must be of the same species as the first, this method of study is not applicable to human cancer, but a very large mass of important facts has come to light through the application of this method. For one thing, it is possible to study the life of the tumour irrespective of the life of the animal in which it is growing, for the tumour can be transplanted from one animal to another through a long series. By this means it is found that the life of the tumour may long outlast the life of the mouse from which it was originally obtained. In many cases, indeed, it appears to be immortal, just as the tumour growing in tissue culture was immortal. It must be understood that when a tumour from mouse A is implanted into mouse B, the new tumour is not derived from the cells of the animal host in which it is growing, but from the original mouse A. This is true no matter how many animals the tumour may be passed through.

Many of the phases of tumour immunity have been studied in relation to transplanted tumours. Thus, if a tumour is transplanted and then excised it is not possible to transplant some more of the same tumour a second time. The tissues of the animal have become resistant, or, as we say, immune. If tumour tissue is radiated outside the body and is then injected into an animal, the tumour will grow for a short time and then die, but the animal will be found to be resistant to inoculation with un-

radiated tumour. Of the nature of this immunity we are profoundly ignorant, but it is possible that lymphocytes may play some part in the resistance to cancer. The possible rôle of the spleen, the organ richest in lymphocytes, is illustrated by the following observation. We have already seen that tumour tissue from one animal can only be transplanted with success into another animal of the same species. But mouse or rat or even human tumours will grow in the chick embryo, being introduced through a window in the egg shell which is then resealed. Tumour growth stops, however, at the twentieth day of embryonic life, the time at which the spleen begins to develop. This date is set much earlier if splenic tissue is introduced through the window at the same time as the piece of tumour. Many other instances could be given of the way in which information about tumours can be obtained by the method of experimental transplantation, but the above examples must suffice.

The second great step was taken by another Dane, this time Fibiger, who was the first man actually to produce cancer in an animal experimentally, as compared with the mere passive transfer of a tumour from one animal to another. Fibiger at the time was not working at cancer but at the entirely unrelated subject of tuberculosis. In the course of this work he noticed that three of his experimental rats developed cancer of the stomach, and on examining these tumours under the microscope they were found to contain fragments of what proved to be a worm. Fibiger then forsook the study of tuberculosis and devoted himself to tumours. He fed this type of worm to hundreds of rats, but never succeeded in producing cancer. Then he learned that when rats are fed with cockroaches they develop worms in the stomach, as the worm passes part of its life history in the cockroach. Fibiger combed Copenhagen for cockroaches which he fed to rats; many developed worms but none developed cancer. Finally in a sugar refinery he found rats living together with a different type of cockroach. Most of the rats had worms and some had cancer of the stomach. He took these new roaches, fed his laboratory rats with them, and obtained cancer. For the first time in history cancer had been produced at will, and for this work Fibiger was awarded the Nobel prize.

And yet this was a feat hardly calculated to arouse wild enthusiasm. To produce tumours in rats by feeding them on cockroaches so that they developed worms was well enough in its way, but it seemed to bear little relation to the problem of the production of cancer in man. The last and greatest step was taken in 1915 by the great Japanese bacteriologist Yamagiwa. It had long been known that workers in coal tar and paraffin oil were liable to develop cancer of the skin. Yamagiwa and his colleague Itehikawa applied this knowledge to the experimental production of cancer in animals. They painted the ear of a rabbit with tar every three days week after week, but nothing happened. With Oriental patience they persisted for 150 days, and at the end of that time a cancerous tumour appeared on the tarred area of skin. The investigator was now in possession of a simple method by which he could produce cancer at will in a laboratory animal. Others had walked along the same path as Yamagiwa and Itehikawa, but none had arrived at the goal. Like Childe Roland they had come to the dark tower, but none of them had set the slug-horn to his lips. Forty years ago a German painted a rat with tar for many months; he had Teutonic patience, but he used the wrong animal; had he used a mouse or rabbit he would have succeeded. A Frenchman did the same with a dog for five months; again the wrong animal. An Englishman used a rabbit, but only for a few weeks; the time was too short. The right tar, the right time, and the right animal must be used.

Other animals than the rabbit are susceptible, the mouse particularly so, the rat and dog not at all. Other irritants besides tar will cause cancer of the skin. The danger of repeated exposure to x-rays is known to every radiologist, and even excessive sunlight is not without danger, a fact which some of our sun-tan beach beauties might bear in mind.

When we try to penetrate a little beneath the surface and understand what is going on we at once find ourselves in tremendous difficulty. The carcinogenic or cancer-producing agent does not need to be applied until the tumour actually appears. It can be stopped long before that date, but the cancer will develop none the less surely. As a result of the continued stimulus some mysterious change takes place in the cell which endows it with the power of

disregarding the inhibition of its environment, of multiplying endlessly, of becoming potentially immortal. How can we conceive such a thing to be possible? It is small wonder that cancer remains the greatest enigma of biological science, the sphinx whose riddle it seems almost hopeless to try to read.

When a large area of skin is tarred, only a very small part becomes malignant. That is a strange fact in itself and not what one might have expected. If the cancerous area be excised another part of the tarred area may become malignant. When this is excised, still a third area may become malignant. What does all this mean? It would appear that the entire tarred area becomes potentially malignant, but that the actual malignant change is confined to a small area which in some way inhibits the development of cancer in the area at large. Removal of the tumour breaks down this inhibition. The only safe thing to do is to excise the whole potentially dangerous area. So it is with cancer of such an organ as the breast. No matter how small the tumour may be, even though it be only the size of a pea, if it is malignant the whole breast has to be removed.

I have spoken as if some external carcinogenic agent such as coal tar or x-rays was all that was needed for the production of cancer. That is far from being the case. In cancer, as in infectious disease, there is an intrinsic factor which we designate the constitution of the patient. This in turn is largely determined by heredity, the physical basis of which, as we have already seen, is furnished by the chromosomes, those minute rods of matter which inhabit the nucleus of the cell. At first sight it appears unbelievable that the tendency to the development of a particular tumour in a particular organ could be transmitted from generation to generation, but that is no more incredible than that the Hapsburg jaw, or blue eyes, or hæmophilia, or mathematical ability should be carried by the chromosomes, and we know definitely that these characters are carried by this means. In the mouse heredity plays a most important part in determining the occurrence both of spontaneous and of experimentally produced cancer, and in man certain tumours, such as glioma of the retina and malignant papilloma of the colon, show a very marked familial incidence. One need not be

unduly alarmed on discovering that cancer has occurred amongst one's ancestors, because there are many disturbing variables in human heredity, and an extrinsic exciting factor is usually, though not invariably, required in addition to the constitutional intrinsic one. At the same time I am convinced that medical men, and especially the family doctor, should devote more attention to the problems of heredity than they have been accustomed to do in the past.

We have travelled a long way from the point from which we started. In the course of that journey we have seen that animals grow in size not by virtue of the cells, the building stones, getting larger, but because these keep on dividing and multiplying. This power to multiply at first appears unlimited, but as differentiation and specialization go on the force of environment begins to make itself felt and growth becomes increasingly inhibited. This inhibition can be overcome by removing the

cells from the body and allowing them to grow in tissue culture, when they put on immortality. Cancer represents a tissue culture in which the cells are freed from the restraint of environment and have learned the secret of perpetual youth.

We have observed some facts in connection with experimental cancer, but their significance, their real meaning, is hidden from our eyes. Some day the light will shine on our darkness, the rough places will be made smooth. Considering the enormous amount of time and money which has been expended on the problem, it may seem that we have little to show. But slowly, surely, the frontier of knowledge is being pushed forward.

Say not the struggle naught availeth,
The labour and the wounds are vain,
The enemy faints not, nor faileth,
And as things have been they remain.

For while the tired waves, vainly breaking,
Seem *here* no painful inch to gain,
Far back, through creeks and inlets making,
Comes silent, flooding in, the main.

STAPHYLOCOCCUS ANTITOXIC SERUM IN THE TREATMENT OF ACUTE STAPHYLOCOCCAL INFECTIONS AND TOXÆMIAS*

By C. E. DOLMAN, M.B., B.S., M.R.C.P., D.P.H. (LOND.),

Research Assistant and Clinical Associate, Connaught Laboratories, University of Toronto, Toronto

III. WHEN DEMONSTRABLE STAPHYLOCOCCÆMIA IS PRESENT

THE theoretical significance of demonstrable staphylococæmia need not be considered here, but that its presence or absence in staphylococcal infections and toxæmias forms a consideration of great practical importance for prognosis is clearly shown by the results in our own series of 104 patients. Among 40 of these who showed no staphylococæmia, 4 died, a mortality rate of 10 per cent; whereas 35 out of 64, or 55 per cent, of those who had staphylococæmia died.

Staphylococæmia and meningitis.—Of the 2 patients in this group, one was moribund when the serum was given. But the other patient, although the prognosis was rather hopeless from the outset, responded in a remarkable way

to intensive antitoxin therapy, and a brief case history is therefore given.

CASE REPORT

A girl of 17 was admitted to the Western Hospital, Toronto, with extensive cellulitis of the face; irrational; temperature, 105.6°; and pulse 120. The primary focus was a furuncle of the cheek. Blood culture grew *S. aureus*. Three days after admission, when she received a first administration of 90 c.c. of antitoxin intravenously, signs of unilateral cavernous sinus thrombosis were already present, and a few days subsequently bilateral thrombosis occurred. However, after 10 days of very intensive serum therapy, by intravenous and subcutaneous routes, one eye which had been protruding to an extraordinary degree, returned to its normal position, and gave a fairly good vision; the quantitative blood culture showed a fall in colony count from about 60 colonies to only 4 colonies per c.c.; temperature and pulse rates were at a lower level, and there seemed a slight chance of recovery. As the risk of meningitis was obviously great, and as the anti-hæmolytic titre of the patient's serum was still not very high, it was emphasized that more antitoxin should be given at regular, frequent intervals. But none was given for 6 days, by which time signs of meningitis began to appear,

* The preceding articles can be found in the *Journal*, 1934, 30: 601, 31: 1.

and the patient died 10 days later, one month after admission to hospital. At the outset it had appeared unlikely that she could survive for more than a few days. In all 1,040 c.c. of antitoxin were given, 750 c.c. intravenously, 180 c.c. subcutaneously, 90 c.c. intramuscularly, and 20 c.c. intrathecally. Following each intravenous administration of serum there was a hyperthermic reaction, the rectal temperature rising on several occasions to between 106 and 107°, and once to 107.8°. The temperature then usually dropped within a few hours by several degrees, to between 99 and 100°; and thence gradually returned to a mean level of from 103 to 105°.

Staphylococcæmia in children secondary to osteomyelitis.—The general mode of treatment and the results obtained in this group of 32 children have been already discussed. The following observations are perhaps of some clinical interest. The site of the probable portal of entry of infection could always be located, although sometimes only after careful search. Boils, pustules, infected abrasions, blisters and mosquito bites, and, once, scabies, were noted. In three or four instances where no skin lesion could be found, swabs taken at our suggestion from the anterior nares and the throat yielded *S. aureus* in almost pure culture. (It may here be suggested, parenthetically, that the large numbers of toxigenic staphylococci sometimes found in the nose and throat of persons who may or may not have signs and symptoms attributable to their presence provide an important link in the etiological chain of the fatal staphylococcal disease simulating laryngeal diphtheria described by Mathew,¹⁵ and of the primary staphylococcal pneumonias to which Reimann¹⁶ has recently drawn attention.)

Four of the patients in this series of cases developed a bilateral parotitis, which in one instance suppurated and was drained. There were many different sites of bone involvement, and multiple foci of osteomyelitis in the same patient were fairly common. The bones of the lower limb were the most frequently involved. The severity of the toxæmia and the degree of blood stream infection did not seem to depend upon the actual site of the main inflammatory focus, except when this was located in or near the hip joint. Osteomyelitis in the neighbourhood of the hip joint is not often diagnosed early, and its satisfactory drainage provides a difficult surgical problem, while infections which localize here seem to tend towards a fulminating type.

CASE 1

In one patient, a girl of 9 years, an unusually early diagnosis was made by aspiration of staphylococcal pus from the hip joint. Open drainage was promptly

undertaken, pus being located within the capsule of the joint as well as inside the pelvis. The infection had probably arisen in the acetabulum. Despite large intramuscular doses of antitoxin, death occurred about 40 hours after operation. The patient had been irrational for 36 hours, and had a cyanotic pallor with fever around 106° for some 8 hours prior to operation. There was, in fact, an overwhelming degree of toxæmia which the relatively slow absorption of antitoxin given intramuscularly was powerless to combat. The portal of entry of the infection was almost certainly the tonsils, which showed intense inflammatory necrosis.

The following three case histories are among the more dramatic of this group:—

CASE 2

A boy of 8 years was admitted to the Hospital for Sick Children, Toronto, acutely ill; temperature, 104.6°; flushed; respirations laboured and irregular. There were pain, tenderness and swelling about the right knee, the right ankle, and the sixth right rib, and a small furuncle was noted on the left leg. The white blood cell count was 9,600 (over 90 per cent polymorphonuclears); and blood culture was positive for *S. aureus* within 48 hours. Two days later the temperature was around 105°, and the boy appeared definitely worse, showing the characteristic cyanotic pallor of severe staphylococcal toxæmia. As the infection around the right knee appeared to be localizing, the upper end of the tibia and the lower end of the femur were exposed, diseased bone was encountered, and pus drained in the accepted way. Sixty c.c. of antitoxin were given intramuscularly before operation, and this dose was given daily until the patient was out of danger. For two or three days following operation the foci in the ankle and chest wall became more tender and swollen, while the right elbow, the lower end of the right radius, and the left hip developed signs of inflammation. But within ten days all these foci had almost resolved, and when the patient left hospital one week later complete resolution had occurred, leaving no residual disability. Blood culture taken daily after operation grew *S. aureus* until the seventh and eighth days, when the first negative blood cultures were obtained; the temperature dropped from nearly 104° to around 100°; and the white blood cell count which had been slowly rising since admission to about 16,000, suddenly jumped to 30,500. Meanwhile, the anti-hæmolytic titre of the boy's serum had steadily risen, until by the tenth day it showed an eight-fold increase over a rather unusually high initial titre. Only 30 c.c. antitoxin were then given daily intramuscularly for 3 days, and thereafter no further antitoxin. On the twelfth day the temperature reached normal for the first time, and the patient left hospital on the nineteenth day after operation. The total amount of serum given was 630 c.c. intramuscularly.

CASE 3

A girl of 6½ years was admitted to the Hospital for Sick Children, Toronto, in a desperate condition, with a history of not more than three days' illness. The temperature was 105.8°; pulse 160, soft and of poor volume; respirations, 32. There was generalized heliotropic cyanosis; the pupils were widely dilated and reacted sluggishly; and the patient was completely irrational. The white blood cell count was 13,000, and blood culture taken on admission grew about 80 colonies of *S. aureus* per c.c. of blood. There were signs of osteomyelitis at the lower end of the right tibia. No primary skin focus was noted, but a swab of her dry and congested throat, taken next day, yielded an almost pure culture of *S. aureus*. Sixty c.c. staphylococcal antitoxin were given intramuscularly. The temperature and cardiac rate continued to rise within the next few hours, so the tibia was exposed and the subperiosteal and intramedullary pus was let out. Vigorous antitoxin therapy was pursued, at first 90 c.c. daily, and

later 60 c.c. daily, being given intramuscularly, the total of 630 c.c. being by coincidence the same amount as was given in the preceding case reported. Although critically ill for two or three days, the patient's condition showed a steady improvement as the anti-hemolytic titre of the serum increased ten-fold. Progress was accelerated after the ninth day, when a small pyogenic focus of the second right metacarpal was drained. A small inflammatory focus which later appeared on the right thigh aborted without pus-formation. Blood culture two days after admission grew only 4 colonies per c.c., and two days later was sterile. The girl was sent to the convalescent hospital, almost afebrile and looking well, one month after operation; and a course of injections of staphylococcus toxoid was then begun.

CASE 4

An ill-nourished boy of 14 years was admitted to Toronto General Hospital on January 5, 1934, with his left eyeball protruding and exuding pus beneath its swollen lids. The condition had started about three days earlier, following toothache in the left upper jaw. The diagnosis of suppurative ethmoiditis and orbital cellulitis was made, and a left ethmoid sinusotomy was performed next day. On January 8th, the patient "looked very ill and toxic", with temperature 102°, and intense pain in the eye. On January 12th an orbital abscess was drained. During the operation bare bone was encountered in the roof of the orbit, and four days later an exploratory operation revealed extensive disease of the frontal bone. The patient received a blood transfusion in preparation for the very radical operation undertaken next day, at which most of the anterior portion of the bony calvarium was removed. On trephining, pus oozed from the diploic spaces, and soft, necrotic bone was removed with rongeurs from the supraorbital ridge, as far back as the temporal bone on the left side and the parietal bone on the right side. The frontal sinuses contained pus, and their bony walls were removed. A large extra-dural collection of pus was found in the left frontal region, communicating by two openings in the dura with an abscess in the brain substance discharging pus. For 24 hours following operation the patient showed considerable shock, with extreme pallor, a temperature range of 101 to 104°, and some loss of word memory; and he continually reiterated the word "nurse". Blood culture and a nasal swab on the 16th (the day before the major operation) having proved positive for *S. aureus*, and pus taken at operation from the brain abscess having grown a similar micro-organism, it was decided on the 18th to give 60 c.c. of staphylococcus antitoxin intramuscularly. Next day the temperature was at a lower level, but on the 20th the patient appeared very much worse. The pulse was rapid and weak, the temperature rose to 105.4°, the boy was quite irrational, and developed a stuttering speech. For nearly 48 hours this condition persisted, no antitoxin being given because it seemed unlikely that he could survive even a slight serum reaction. Late on the 21st, the temperature fell to around 103°, and 60 c.c. antitoxin were then given intramuscularly. By next morning a most remarkable improvement had occurred; the temperature was within normal limits, the boy was quite rational, recognized people, and asked to be read to. A further 60 c.c. of antitoxin were given next day, making a total of 180 c.c. intramuscularly. For ten days the patient remained afebrile, and no spread of osteomyelitis occurred. But considerable discharge continued from the brain abscess, and, beginning February 4th, a mild fever developed, which was attributed to a possible extension of suppuration in the brain substance. The patient was very emaciated, despite an excellent appetite, and the pulse rate was high in proportion to the temperature. These were the only discouraging features. Active immunization with weekly doses of staphylococcus toxoid was begun on February 10th, a procedure which appeared definitely to bring about a gradual return of the temperature to normal and a lessened amount of discharge. After eight doses of toxoid the patient now has a good

colour, weight is being rapidly gained, the pulse rate has returned to normal, and he seems likely to make a complete recovery. I am indebted to Dr. P. G. Goldsmith, Professor of Oto-Laryngology in the University of Toronto, for access to this patient and to his case-history.

Staphylococæmia in children not secondary to osteomyelitis.—Of the 8 children in this group, 2 had extensive facial cellulitis and an orbital abscess, with thrombosis of a cerebral vein and empyema of the sphenoid sinus in the one case, and cavernous sinus thrombosis in the other. One patient, whose illness dated from the appearance of a furuncle inside the nose several days earlier, was moribund before antitoxin therapy was considered, while the prognosis for the other patient was also considered hopeless. Blood culture showed both to have a very severe degree of staphylococæmia, and intramuscular serum proved powerless to avert an early fatal issue. Two other young children had acute lymphatic leukaemia, and antitoxin was given without avail at a late stage of the disease, after staphylococæmia was discovered.

CASE REPORTS

Of the two remaining fatal cases, one was in a girl aged 7 years, admitted to hospital in a desperate condition within twenty-four hours of the onset of illness; cyanosed, irrational, vomiting repeatedly, and with a temperature of 105.4°. She had a severe staphylococæmia, a leucopenia, (the white blood cell count on the third day was 4,200), and no obvious pyogenic focus. By the fourth day, when intramuscular antitoxin was first given, it was obvious that nothing could arrest the fulminating progress of the disease. Broncho-pneumonia developed, and death occurred four days later. The white blood cell count fell as low as 3,500 on the day before death.

The other patient, a boy of 15 years, entered hospital with fever, vomiting, tonsillitis, and pain in the chest. There was a boil on the chin which had begun to discharge pus four days previously. During the first two days after admission there was frequent vomiting and occasional epistaxis, an erythematous rash appeared on chest and chin, and also sporadic rose-red spots, and signs of double broncho-pneumonia developed. Blood culture taken at this time proved negative, but a day or two later gave *S. aureus*, as also did the sputum. Between the fourth and eleventh days after admission a total of 360 c.c. antitoxin were given intramuscularly, and several superficial staphylococcal abscesses were drained. By the end of this period the boy's condition had improved, and it seemed that he might recover. But about three weeks after admission there was severe pain around the left hip joint, and x-ray showed bone destruction near the articular surface of the head of the femur. No drainage of the joint was attempted, and there was occasional vomiting and mild fever during the next two weeks. One day about six weeks after admission the pulse rate suddenly rose to 160, the left thigh became very swollen, and the inflammatory swelling rapidly spread to the perineum and over the abdomen. On making a small incision into the right flank, and puncturing the external oblique muscle, large amounts of blood and pus poured out, and the patient died shortly afterwards.

The two patients who recovered in this group were given antitoxin intravenously. One, a boy of 2 years, was admitted to hospital with a temperature of 104.2°;

pulse, 148; acute follicular tonsillitis; and cellulitis of the left foot. A blood culture taken on admission gave *S. aureus*, and a throat swab taken a day or so later gave a pure culture of the same micro-organism. On the third evening after admission, staphylococcus antitoxin was given intravenously, diluted in physiological saline, by slow continuous drip. After 120 c.c. of serum had been given, a severe reaction occurred. There was first a rigor, and then for from three to five minutes the child showed a mottled cyanosis, and the pulse was imperceptible. Following this, considerable improvement was apparent, and for about 36 hours the temperature was normal. However, it then rose again to about 104° , the pulse went up to around 160, signs of toxic myocarditis were noted, and the prognosis was considered hopeless. Further amounts of antitoxin were given intravenously, 85 c.c., 70 c.c., and 40 c.c., on the third, fourth and fifth days, respectively, after the first administration. Very little serum reaction occurred; the titre of circulating antitoxin suddenly rose to a high level, and the patient appeared distinctly better. Next day staphylococcal pus was drained from the inflammatory area in the foot, which was thought to have developed metastatically from the tonsillar focus. One week later the patient was afebrile, and left hospital perfectly well three weeks after admission, a total of 315 c.c. of antitoxin having been given intravenously.

The other patient, a boy of 13 years, was admitted to the Brantford General Hospital under the care of Drs. J. I. Palmer and M. N. Paris, with a history of migratory joint pains and fever for ten days, and complete inability to void urine for three days. The left pupil was noticeably larger than the right. Lumbar puncture revealed no abnormality of the cerebrospinal fluid. The white blood cell count was 36,000 (93 per cent polymorphonuclears), and blood culture gave *S. aureus*. After two days pus appeared in the urine in great quantities, the temperature having meanwhile ranged from 100 to 104° . Three days later, 15 c.c. antitoxin were given intravenously and 15 c.c., intramuscularly, and the boy seemed brighter next morning. Two days after the first serum administration, a further 30 c.c. were given intravenously, following which the urine was clear and the patient voided voluntarily. Two days later again a final 60 c.c. were given intravenously. Blood culture on this day was still positive, and a small abrasion present over the sacrum on admission had by now developed into a shallow abscess, which was incised and yielded staphylococcal pus. From then on the patient steadily improved; the temperature reached normal limits a few days later, and further blood cultures were negative. The sacral abscess was the only focus to localize, and the boy had no residual disability. He received a total of 105 c.c. antitoxin intravenously, and 15 c.c., intramuscularly; and during convalescence received a course of injections of staphylococcus toxoid. It was observed that the inequality in size of the pupils disappeared after each dose of antitoxin; and that after the first administration of antitoxin, the patient lost the extreme irritability and tenderness which had previously been so marked as to necessitate, for instance, a general anæsthetic before he could be moved from his bed to an x-ray couch.

Staphylococœmia in adults and adolescents.—

Among the 17 fatal cases in this group were 4 male adolescents, aged 16 to 21 years, whose illness began with osteomyelitis; 2 middle-aged adults, one male and one female, with fulminating recrudescences of infection in an old osteomyelitis focus; 2 males and 1 female who developed staphylococœmia following surgical operations for second-stage prostatectomy, appendicectomy, and arthrodesis of a non-infected

hip joint respectively; 1 man and 1 woman who had a carbuncle as the primary infection; in 1 man subject to boils, a metastatic infection near the hip joint began the fatal illness; 1 case of septic abortion; and 1 which began as a septic pneumonia following a breast abscess in a woman whose baby had bitten her nipple.

The symptomatology presented by these cases was no less varied than was their etiology, but if a composite clinical picture of generalized staphylococcal infection and toxæmia were to be drawn of them the following features would have to be incorporated: in the earliest stages of the disease, a history of migratory pains and general malaise with occasionally rigors; abdominal pain or flatulence, and sometimes vomiting; a persistently high temperature and pulse rate; the existence of a primary focus of staphylococcal infection in the skin, in an old site of osteomyelitis, or in the nose and throat; a congested face, with slight cyanosis and sometimes jaundice; restlessness; a spurious mental alertness; and dilated pupils. Leucocytosis, and a palpable liver and spleen, are of less specific import. In the later stages, a swinging temperature with disproportionately high pulse rate; profuse sweating and cyanotic pallor; rapid loss in weight; mental confusion or even stupor; abdominal distension and incontinence of fæces, with repeated vomiting; pyuria; congestion, and, possibly, patchy consolidation of the lungs; and the appearance of erythematous rashes, pustules, hæmorrhagic papules, or pale coffee-coloured macules.

As has been previously reported, a remarkable degree of temporary improvement occurred in some of these quite hopeless cases after intravenous administration of antitoxin. For instance, Professor Murray reports that one patient, moribund and comatose before antitoxin was given, with over 2,000 colonies of *S. aureus* grown from 1 c.c. of blood, became conscious shortly after serum was given, requested coffee, and complained of the grounds at the bottom of the cup!

The following three cases were treated at the Royal Victoria Hospital, Montreal, under Professor Murray's direction.

CASE I

A man of 34 fractured his nose and bruised his chest in an automobile accident. Three days later he developed general malaise and a high fever, and after two days was admitted to hospital with a temperature of 104° and cellulitis of the frontal and nasal regions. Within two days the left eyeball began to protrude.

blood culture showed a fairly severe degree of staphylococæmia. Ninety c.c. of antitoxin were given intravenously. Following this, the eye, which had protruded to an extraordinary degree and become blind, returned to its normal position without operative interference, and blood culture was temporarily sterile. A few days later quantitative blood culture showed a slight degree of staphylococæmia to be again present. While under anaesthesia for drainage of an abscess of the chest wall, a further 50 c.c. of antitoxin were given intravenously, without the characteristic reaction ensuing, after which blood cultures were repeatedly sterile. However, a long series of staphylococcal abscesses formed and were drained. Their sites were the sterno-clavicular and the acromio-clavicular joints, the groin, the face, the left orbit, and the subtemporal region. Sequestrectomy of the left parietal and frontal bones was also necessary on account of osteomyelitis there. Finally, 3½ months later, a chronic staphylococcal abscess of the left frontal lobe, which had been causing Jacksonian seizures, was drained. The development of a brain abscess was anticipated, as signs of middle cerebral artery thrombosis, attributed to a septic embolus, appeared during the early days of the illness. A prophylactic dose of 30 c.c. antitoxin was given intramuscularly at the time of operation. The patient now rapidly improved, and after 2½ months was discharged from hospital free from staphylococcal infection, having received 150 c.c. of antitoxin intravenously and 30 c.c. intramuscularly.

CASE 2

A man of 65 developed a staphylococæmia, growing 120 colonies from 1 c.c. of blood, some 7 weeks after removal of the gall bladder for acute cholecystitis. He had been discharged with a sinus in the laparotomy wound, and a small staphylococcal abscess was now found in the track of the old wound. Within ten days a total of 240 c.c. antitoxin were given intramuscularly, and the blood culture became sterile. A staphylococcal abscess developed in the scapular region ten days later, which was inadequately drained, the incision being allowed to close up. Shortly afterwards, blood culture was again positive for *S. aureus*, and a further 60 c.c. of antitoxin were therefore given intramuscularly. Following this the patient seemed better for a few days, but signs of constriction of the cord appeared, and an epidural abscess between the seventh and tenth thoracic vertebrae was diagnosed and skilfully drained by Dr. W. Cone. The patient was given daily doses of 60 c.c. antitoxin intramuscularly for three days, followed by several smaller doses at longer intervals; no staphylococæmia was detected. The neurological signs rapidly improved, but three weeks after the laminectomy an empyema developed, which was drained by thoracotomy and resection of the seventh rib. The pus contained *S. aureus*, and also pneumococcus, Type II. For a day or two, small doses of both staphylococcus antitoxin and Type II anti-pneumococcus serum were given intramuscularly, and the patient did very well. Active immunization with staphylococcus toxoid was begun when he was afebrile, and no further infections developed. Altogether, 530 c.c. of staphylococcus antitoxin and 20 c.c. of anti-pneumococcus serum were given intramuscularly. No undue serum reaction occurred on any occasion.

CASE 3

One other patient treated under Professor Murray's direction was a woman seen at the Montreal General Hospital, with a characteristic temperature and pulse chart of some eight days' duration, but with no evident primary lesion and no apparent metastatic abscesses. Three blood cultures had grown *S. aureus*. After 180 c.c. of antitoxin had been given intramuscularly within five days blood culture became and remained sterile, and the woman made a rapid and complete recovery.

CASE 4

A male, aged 57, was admitted to the Toronto General Hospital, under the care of Dr. F. W. Rolph, acutely ill with fever, a boil in each axilla and another near the anus, and a palpable spleen. The axillary boils had developed about two weeks earlier, and since then he had experienced occasional pain and burning on micturition. Four days before admission he had passed dark red blood *per urethram*, and subsequently had felt very weak. Blood culture taken on admission grew *S. aureus*, but no colonies from 1 c.c. of blood. Three days later quantitative culture showed 12 colonies per c.c. of blood, and on this day the first dose of 60 c.c. antitoxin was given intramuscularly. For the next twenty-five days, 60 c.c. of antitoxin and occasionally more were given daily, until a total of 1,700 c.c. had been administered intramuscularly. Daily blood cultures were taken during this period, all of them, with two exceptions, proving positive; but the quantitative culture never grew more than 5 colonies per c.c. after serum therapy was instituted. Blood culture done on the day the last dose of serum was given, and on subsequent occasions, proved negative. During the first three weeks, several boils developed and were opened, while catheter specimens of urine from both ureters grew *S. aureus* in pure culture and showed many pus and red blood cells. The staphylococcal focal nephritis and a mild septic fever persisted after blood culture had become sterile, so active immunization with staphylococcus toxoid was begun. The fever gradually abated, and the urine became free from pus and blood after six doses of toxoid had been given at 5-day intervals.

Although this patient when first seen did not appear as desperately ill as did most of the others in this group, the intensity of infection and toxæmia would probably have increased and culminated in a fatal issue if a high titre of circulating antitoxin had not been ensured by continuous serum therapy. The strain of staphylococcus isolated from his blood stream proved *in vitro* very similar in toxigenic capacity to strains isolated from fulminating types of infection.

CASE 5

A male aged 31 had hæmorrhoidectomy performed at Christie Street Hospital, Toronto. At the time of operation several pustules from which *S. aureus* was subsequently isolated were present over the body. The patient ran a febrile post-operative course, from the fifth day onward the temperature being around 104 to 105°. Ten days after operation *S. aureus* grew from blood culture; large numbers of pus cells were noted in the urine; and the white blood cell count was 20,000. Three days later the temperature was 105°, the spleen palpable, there was a staphylococcal pustular rash on the buttocks and thighs, and the patient was repeatedly vomiting and had involuntary bowel movements. Sixty c.c. of staphylococcus antitoxin were given intravenously on this day, 10 c.c. being injected hourly into the tube of a continuous-drip apparatus delivering physiological saline. There was a moderate serum reaction, but the next day the patient seemed better, and therefore no serum was given. However, starting the following day, intensive antitoxin therapy was instituted, 120, 60, 130, 70, and 100 c.c. being given intramuscularly on consecutive days, followed by 60 and 60 c.c. intramuscularly. Additional intramuscular serum was later given, so that within eighteen days the patient received altogether 540 c.c. intravenously, and 480 c.c. intramuscularly. On the second day after the first administration of serum, and for several days subsequently, *S. aureus* was present in the urine; on the same day blood culture gave 500 colonies per c.c. of blood. On the third day there were 350 colonies per c.c., and on the fourth day 150. Blood culture on the fifth, eleventh, and fifteenth days grew *S. aureus* (not estimated quantitatively), and on the sixteenth and seventeenth days was negative. No further serum was therefore given. On the eighth day after the institution of serum therapy a large amount of staphylo-

coecal pus was drained from an abscess in the arm. No other metastatic abscesses occurred, and the patient's temperature reached normal on the twenty-fourth day, or about five weeks after operation. He left hospital three weeks later with no apparent residual disability.

COMMENTS

Since this paper was accepted for publication further laboratory evidence has been reported to which attention may relevantly be drawn. By injecting rabbits with a series of subcutaneous injections of living toxigenic staphylococci, followed by injections of staphylococcus toxoid, Connor and McKie¹⁷ have been able to establish complete immunity in rabbits to staphylococcal toxin and to massive doses of living toxigenic staphylococci introduced intravenously. This acquisition of immunity was accompanied by a marked rise in the staphylococcus antitoxin content of their serum, as measured by the anti-hæmolytic method. Parish, O'Meara, and Clark,¹⁸ report that active immunization with toxoid confers on guinea-pigs and rabbits a very high degree of resistance to the pyogenic lesions which normally

follow injection of living cultures of staphylococci; and they further state that rabbits immunized with toxoid have survived intravenous injection of many lethal doses of staphylococcus culture. Moreover, a definite degree of protection against infection by living staphylococci, as well as against the effects of staphylococcus toxin, was conferred on mice and rabbits by passive immunization with antitoxic serum.

This recent work clearly supports the main contention of the present series of papers, that to confer antitoxic immunity upon a patient by passive immunization with antitoxic serum, and later by active immunization with toxoid, offers the most hopeful and reasonable type of specific treatment at present available for acute staphylococcal infections and toxæmias.

REFERENCES

(Continued from Pt. II)

15. MATHEW, R. Y., *M. J. Australia*, 1930, 1: 34.
16. REIMANN, H. A., *J. Am. M. Ass.*, 1933, 101: 514.
17. CONNOR, J. I. AND MCKIE, M., *Brit. J. Derm. & Syph.*, 1934, 46: 20.
18. PARISH, H. J., O'MEARA, R. A. Q. AND CLARK, W. H. M., *The Lancet*, 1934, 1: 1054.

THE HISTOLOGICAL DEMONSTRATION OF SILICEOUS MATERIAL By MICROINCINERATION*

By DUDLEY A. IRWIN, M.B.,

*Department of Medical Research, Banting Institute, University of Toronto,
Toronto*

THE demonstration of siliceous material in histological preparations has been most unsatisfactory. This has been due to (a) the translucency and minuteness of the siliceous particles; (b) the close approximation of the refractive indices of histological mounting media and the siliceous particles; (c) the presence of "ooeult" (hydrated) siliceous material; (d) the presence of an opaque covering on the siliceous particles, such as carbon (Fig. 9).

In the past, siliceous material, being doubly refractive, has been demonstrated in histological sections of tissue by the use of crossed Nicol prisms (Fig. 2). This method is unsatisfactory, as a great many substances apart from silicon compounds, including fibrous tissue and smooth muscle, are doubly refractive. One-half of the

total number of finely divided doubly refractive particles, when viewed at one time between crossed Nicol prisms, are in the extinction phase and are not visible. Histological mounting media usually contain a few small, doubly refractive particles.

The incineration of histological preparations has been used extensively by Policard,¹ Cowdry,² Scott³ and Schultz-Branns⁴ to correlate inorganic material with histological structure. The method consists of mounting the unstained histological section on a glass slide and heating it until all the organic material has been removed by oxidation (Fig. 3), leaving only the inorganic ash. This ash is left so remarkably *in situ* that most tissues can readily be recognized from their ash pattern. Policard¹ *et al.* and Scheid⁵ have used microincineration to demonstrate siliceous material in histological sections. The method de-

* Read before the Section of Medicine, Toronto Academy of Medicine, on March 13, 1934.

scribed in this communication can be used routinely in any pathological laboratory by making use of the ordinary formalin-fixed paraffin-cut sections of tissue. The author has found the ash of an incinerated section of tissue to be soluble in strong mineral acids, with the exception of siliceous material which is practically insoluble (Figs. 4, 7, 10). Such material can be related to the histological structure in which it was contained by means of serial sections (Figs. 5, 6, 7 and 8, 9, 10).

THE TECHNIQUE OF MICROINCINERATION

When the more soluble compounds (sodium, calcium, etc.) are being investigated, a 10 per

cent solution of formalin in absolute alcohol³ is necessary as a fixative. Some of the tissues used in this study had been fixed in 10 per cent formalin for some months or years. Formalin fixative, on standing, slowly liberates formic acid. The siliceous material, being relatively insoluble in acid, was apparently little disturbed.

Histological preparation.—The tissues were dehydrated in ascending alcohols, cleared in xylol and were imbedded and cut in paraffin. Sections 5 microns in thickness were quite satisfactory. If a tissue contains an excessive amount of inorganic material, sections thicker than 5 microns are not satisfactory for incineration, due to "spitting" of the ash during the process

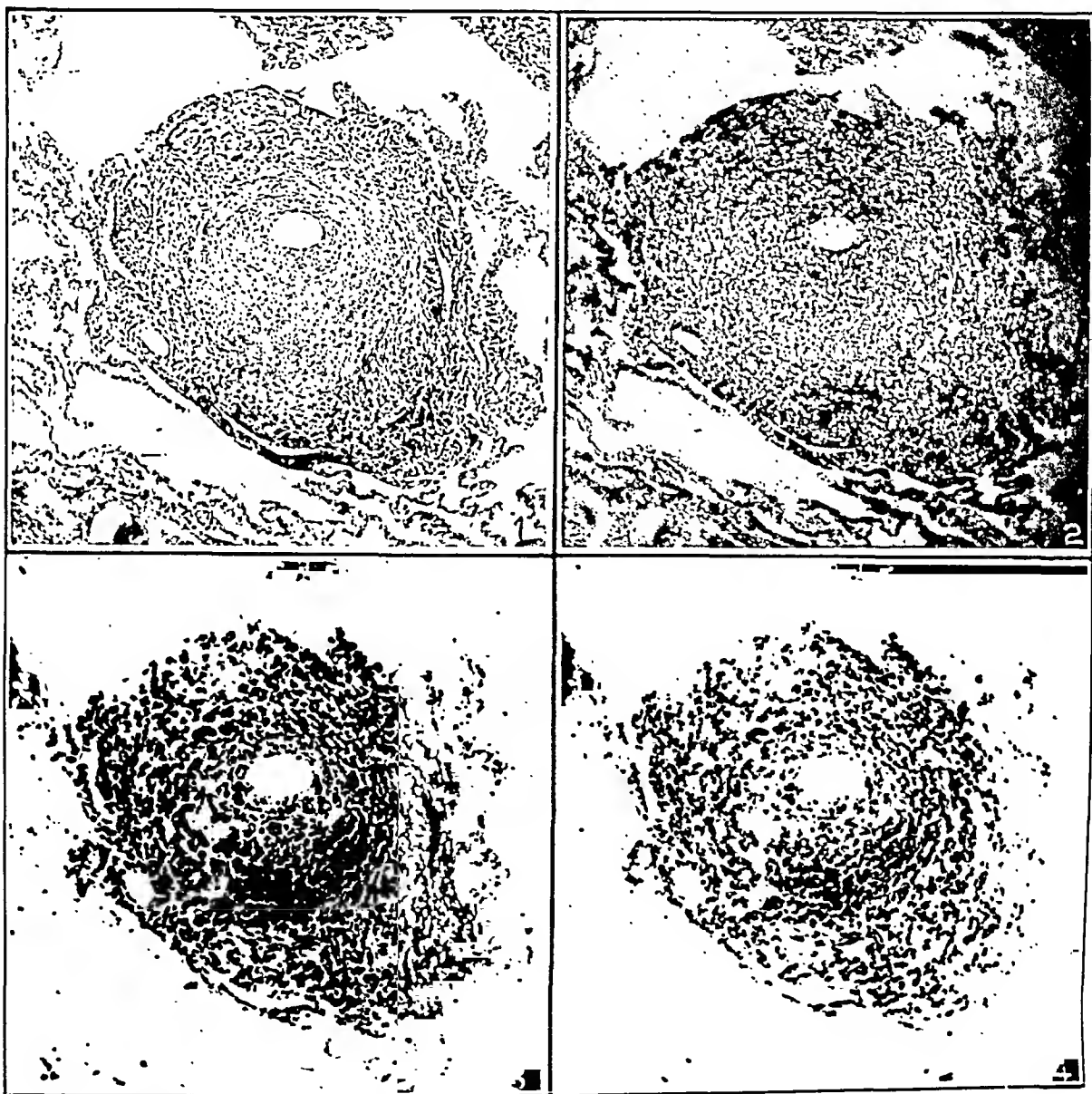
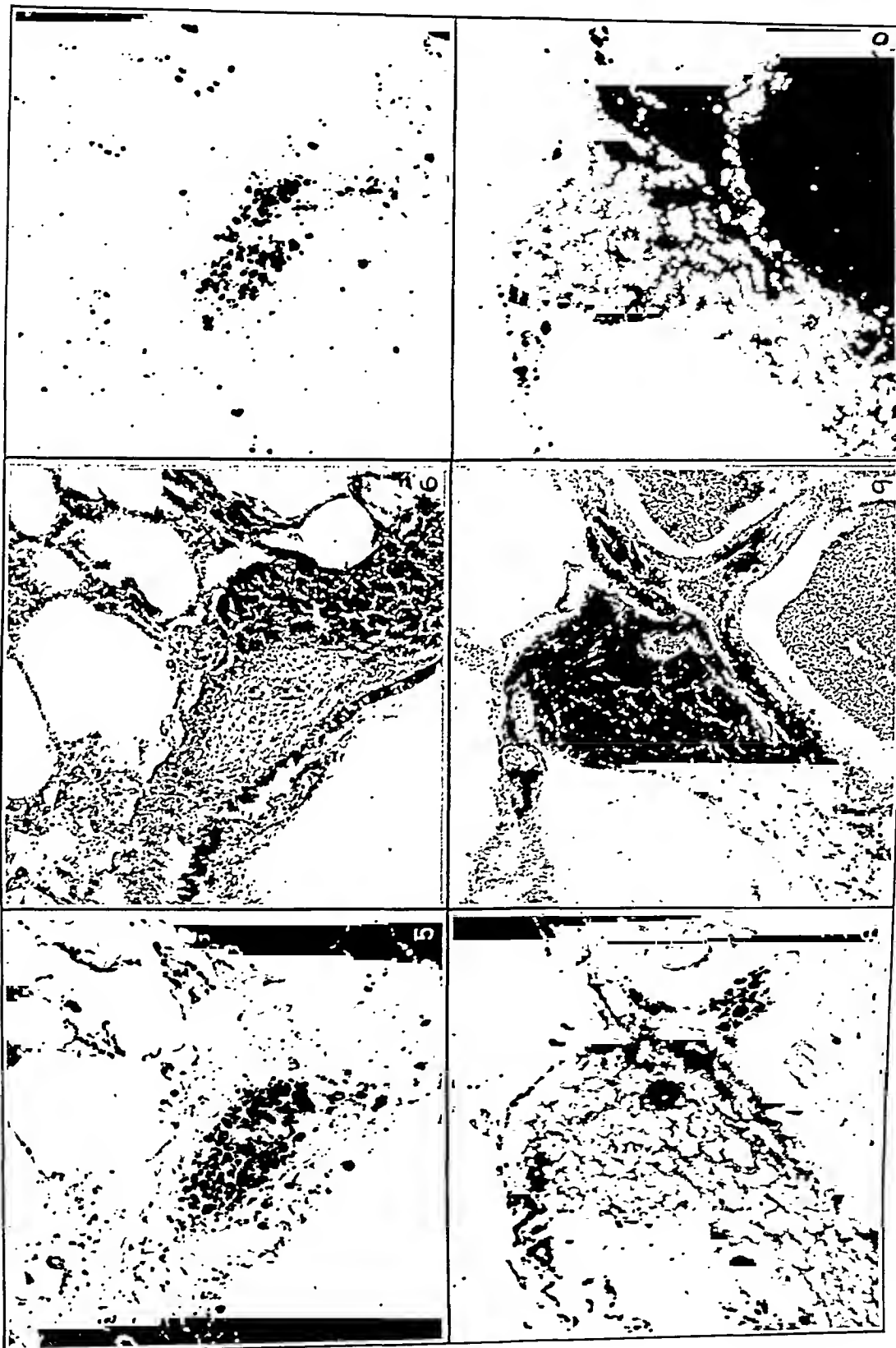


FIG. 1.—Serial section 1. Early silicotic nodule from the lung of a gold miner. Hematoxylin and eosin. Mag. 100x.
 FIG. 2.—Serial section 1. Same nodule as seen between crossed Nicol prisms. Mag. 100x.
 FIG. 3.—Serial section 2. Appearance of the same nodule after incineration. Mag. 100x.
 FIG. 4.—Serial section 2. The same incinerated section after treatment with concentrated hydrochloric acid. Mag. 100x.



Figs. 5, 6, 7.—Serial sections of an early silicotic fibrosis in a peribronchial lymphatic aggregation of a rabbit that had been exposed to silica dust. Figs. 5.—Serial section 1, after incineration. Figs. 6.—Serial section 2, stained with hematoxylin and eosin. Fig. 7.—Serial section 3, stained with concentrated hydrochloric acid. Mag. 100x.

Figs. 8, 9, 10.—Serial sections of an area of peribronchial fibrosis in the lung of a coal miner. Figs. 8.—Serial section 1, incinerated. Figs. 9.—Serial section 2, stained with hematoxylin and eosin. No doubly refractile particles could be seen with crossed Nicol prisms. Figs. 10.—Serial section 3, stained with concentrated hydrochloric acid. Mag. 100x.

of heating. White-edged slides are found to resist heating better than green-edged ones.

Incineration of sections.—The preparations were incinerated on a chromium-nickel tray in a specially constructed quartz electric oven. They were heated gradually to 550-600° C. (dull red in daylight) and this heat was maintained for one hour. When cool, the incinerated sections were examined microscopically by direct oblique illumination for the presence of any carbonaceous residue, a sign of incomplete combustion. With this illumination the dark carbonaceous material stands out prominently against the white background of ash. Some sections required further incineration. When incineration was complete the preparation was protected by a coverslip attached to the slide by means of wax at the corners.

Acid treatment of incinerated sections.—Concentrated hydrochloric acid (c.p.) was found to be the most satisfactory solvent of the non-siliceous material. One c.c. of the acid at room temperature was delivered to the slide adjacent to the ash and allowed to flow gently over the ash. The acid was allowed to remain 30 minutes and was drained off. When excessive amounts of iron were present in the ash the slide was gently heated to accelerate the reaction after the acid had been added. Following acid treatment the preparation was carefully rinsed with flowing distilled water, and the slide placed in a vertical position and allowed to dry spontaneously.

Serial sections.—Serial sections facilitated the microscopic orientation and study of similar areas of tissue. As a routine all tissues were cut serially (Figs. 5, 6, 7 and 8, 9, 10) and three consecutive sections treated as follows:

Section 1—Incinerated only (Figs. 3, 5, 8).

Section 2—Stained with hæmatoxylin and eosin (Figs. 1, 6, 9).

Section 3—Incinerated, followed by hydrochloric acid treatment (Figs. 4, 7, 10).

When special stains were required, serial sets of five were used; slides 1, 3 and 5 were stained and slides 2 and 4 incinerated.

The microscopic examination of incinerated sections.—Direct illumination by transmitted light was found to be the most satisfactory for the study of the morphology of the ash particles at high magnification. Dark-field illumination was fairly satisfactory but had the disadvantage of illuminating all particulate matter to much

the same intensity. Reflected illumination was most satisfactory for routine examination, as the inherent colour shades of the ash particles could be observed. With this lighting the intensity of illumination of the ash particles was an indication of their relative translucency. A special apparatus* was used to provide this type of illumination.

DESCRIPTION OF INCINERATED SECTIONS

Normal tissues.—The general topography of the ash enables recognition of the tissue. The fixed cells of most tissues present an ash that delineates the cell boundaries and nucleus. Small irregular deposits of ash are scattered through the cytoplasm and nucleus. Red blood cells and most leucocytes cannot be recognized individually, but when present in numbers present a characteristic collective ash. Three types of ash are present.

1. Greyish white ash.—This makes up a large percentage of the total ash. The particles are small (2 μ or less) and amorphous. This ash is readily and completely soluble in concentrated hydrochloric acid, and in all probability represents the chlorides, carbonates and phosphates of magnesium, calcium, sodium and potassium which were present in the tissue.
2. Red ash.—The red ash is confined usually to the lumina of blood vessels and corresponds to collections of red blood cells. The individual particles are very small (2 microns or less) and have a characteristic red rust colour. This ash is quite soluble in concentrated hydrochloric acid, yielding a yellow solution in which iron is demonstrable. It is probably iron oxide.
3. White ash.—This brilliantly white ash is seldom seen in the normal tissues, except of the skin and rectum, and there only in very small amounts. It is insoluble in concentrated hydrochloric, nitric and sulphuric acids. It is readily soluble in hydrofluoric acid. Optically, it is doubly refractive. This material consists of silica and silicates.

Pathological tissues.—Microincineration was used most advantageously in sections that contained excessive amounts of siliceous material. In these tissues the siliceous material for the most part was localized to areas scattered through

* Carl Zeiss Epi-Mirror.

the section. This concentration greatly facilitated its demonstration and relation to histological structure. Observations on the siliceous material present in pathological tissues will be published in the near future.

THE ACID TREATMENT OF ASH

The strong mineral acids were tried, and concentrated hydrochloric acid (c.p.) was found to be the best solvent of the non-siliceous material in the ash. This treatment removes all mineral constituents of normal tissue except compounds of silicon. The ash of a silicotic lung treated with concentrated hydrochloric acid consists almost entirely of silica and silicates.⁴ Other substances are insoluble in concentrated hydrochloric acid, but are very unlikely to be present. Gold and platinum, if present, would not be removed, but need only to be mentioned. Silver chloride is also insoluble in hydrochloric acid, but is not doubly refractive. This substance, if present, could be quickly dissolved by ammonium hydroxide. Barium sulphate, being relatively insoluble in concentrated hydrochloric acid, would remain on the slide. This substance is white, and, being doubly refractive, would be interpreted as being of a siliceous nature. Barium sulphate in appreciable amounts is almost never present in tissue. If present, it can be removed by treatment with warm concentrated sulphuric acid.

FUSION OF ASH TO SLIDE

When excessively heated (700° C.+) much of the ash fused to the slide, which showed signs of warping and pitting of the surface. The ash could not be physically wiped from the surface of such a preparation or completely removed by acid. Such preparations were discarded. Incineration at 550-660° C. did not change the appearance of the glass slide, and the ash could be removed by wiping with a dry cloth.

RELATION OF THE HYDROCHLORIC ACID INSOLUBLE RESIDUE TO THE CHEMICAL ASSAY OF TOTAL SILICA

It was observed that the acid insoluble material of incinerated sections from various tissues seemed to be proportional to the assay of that tissue for siliceous material. To investigate this observation ten blocks of tissue were selected from five silicotic lungs. In each case

there had been a history of long exposure to mine dust containing siliceous material. The blocks were cut from areas that had as uniform a consistency throughout as possible. The blocks were halved. One-half was assayed by Dr. E. J. King for total silica by his own method.⁵ The result is expressed in mg. of silica per 100 g. of dried tissue. The other half was cut in paraffin and serial sections were prepared and incinerated, as previously mentioned. The acid-treated incinerated sections were arranged, without knowledge of the chemical assay, in order of the descending magnitude of the acid insoluble residue per unit area. The results are shown in the following Table.

Block No.	Arrangement of incinerated sections in lessening amounts of acid insoluble residue per unit area		Mg. SiO ₂ per 100 g. of dried tissue
1	1	2,640	
2	2	1,300	
3	4	1,240	
4	5	1,150	
5	3	1,107	
6	6	976	
7	7	475	
8	8	420	
9	9	400	
10	10	370	

The author does not suggest that an acid-treated incinerated section of tissue containing siliceous material should supplant chemical assay for the quantitative estimation of that material. This method can be used as a quantitative guide of the siliceous content, and as such is frequently helpful. The minimum amount of siliceous material that can be recognized in an incinerated section of tissue and related to histological structure depends upon the concentration of that material at focal points. Siliceous material to the extent of 100 mg. per 100 g. of dried tissue may be present, but if uniformly dispersed throughout the tissue it cannot be identified with any histological structure. Very small amounts may be recognized if the local concentration is sufficient, though the total assay may be low. The siliceous material present in a single alveolar phagocyte of an animal exposed to silica dust can readily be demonstrated.

SUMMARY

A method is described for the demonstration of siliceous material in histological sections of tissue. This consists in the incineration of the

histological section and the subsequent treatment of the ash with acid to remove the non-siliceous material.

The author wishes to thank Dr. F. G. Banting for his many helpful suggestions, and Dr. T. L. Walker, Professor of Mineralogy and Petrography, and members of his Department for advice in those subjects.

REFERENCES

1. POLICARD, A.: Sur une methode de microincineration applicable aux recherches histochimiques, *Bull. Soc. Chim. de France*, 1923, 33: 1551.
2. COWDRY, E. V.: Microincineration of intranuclear inclusions in yellow fever, *Am. J. Path.*, 1933, 9: 149.

3. SCOTT, G. H.: Distribution of mineral ash in striated muscle cells, *Proc. Soc. Exp. Biol. & Med.*, 1932, 29: 349.
4. JEPHCOTT, C. M.: Silicate content of silicotic lung ashes, *Canad. Chem. Met.*, 1934, 28: 32.
5. KING, E. J. AND STANTIAL, H.: Biochemistry of silicic acid; microdetermination of silica, *Biochem. J.*, 1933, 27: 990.
6. SCHULTZ-BRAUNS, O.: Histo-topochemische Untersuchungen an krankhaftveränderten Organen unter Anwendung der Schnittveraschung, *Archiv. f. Path. Anat.*, 1929, 273: 1.
7. POLICARD, A., DOUBROW, S. AND BOUCHARLAT: A propos du mecanisme de la silicose pulmonaire, *Bull. d'hist. appliq. à la physiol.*, 1929, 6: 371.
8. SCHEID, K. F.: Über die Methodik der Darstellung und Bestimmung des in pneumokoniotischen Geweben abgelagerten Staubes, *Beitr. z. Path. Anat. u. z. allg. Path.*, 1932, 89: 93.

MICROINCINERATION AS AN AID IN THE DIAGNOSIS OF SILICOSIS*

By DUDLEY A. IRWIN, M.B.,

*Department of Medical Research, Banting Institute, University of Toronto,
Toronto*

THE pathologist is frequently the last court of appeal in the diagnosis of pulmonary silicosis. The period of dust exposure, the amount and type of dust breathed, the clinical course of the disease, the presence or absence of an accompanying tuberculous infection, the physical and roentgenological chest findings, and the chemical assay of the siliceous content of the lung tissue, are very important in the diagnosis of pulmonary silicosis and in the determination of the amount of siliceous fibrosis present. Important as these findings are, however, it is the pathologist who must ultimately determine by microscopic examination the amount and distribution of siliceous fibrosis in the lungs, and from his findings give an opinion on the importance of the sequelæ of this fibrosis in the ultimate cause of death.

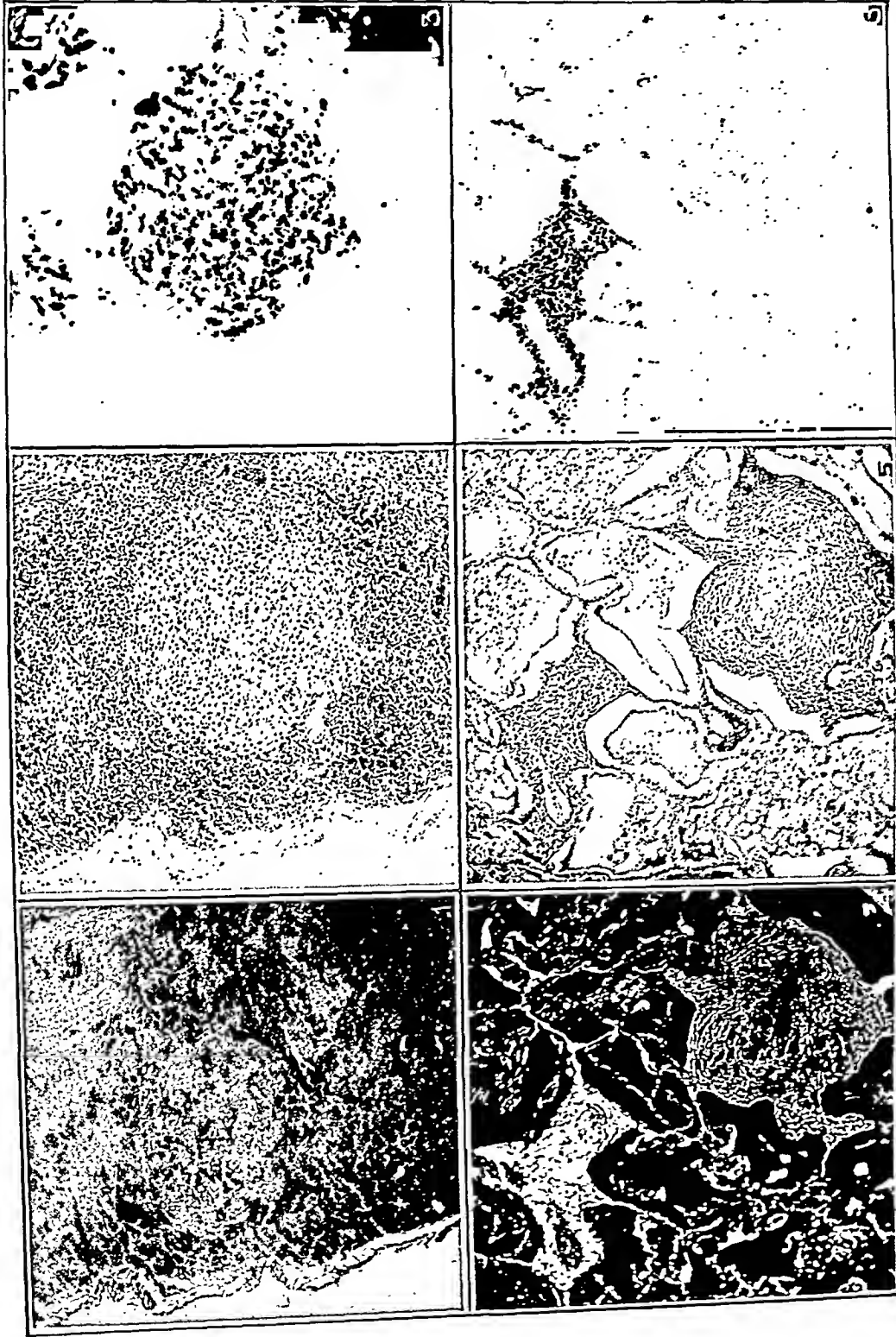
Siliceous fibrosis can be defined as a fibrous tissue reaction in which can be demonstrated relatively large amounts of siliceous material, distributed diffusely throughout that tissue in a characteristic manner. On account of the association of siliceous material with the fibrosis in human silicotic lungs; from the fibrous reaction constantly produced by the injection of finely particulate silica into experimental animals at the site of the silica; from the inability to produce similar fibrous lesions with many compounds other than silica, one must infer that the siliceous material is responsible for the

fibrous reaction and that the harmful silicon compound is silica.

Clinically, siliceous fibrosis is limited almost entirely to the lungs and to the course of the lymphatic channels draining these organs. Pulmonary tuberculosis is almost always the immediate cause of death in pulmonary silicosis. Tuberculous fibrosis can so simulate siliceous fibrosis that, at times, even microscopically, they cannot be separated by their morphological characteristics or by special staining. Fibrosis not of siliceous or tuberculous origin may be present to further complicate the picture.

The chemical assay of the total siliceous material in a peribronchial or mediastinal lymphatic gland may be quite high without the presence of siliceous fibrosis. Unfortunately, the siliceous compounds present in silicotic lungs are in such a finely particulate state that their identification, chemically or petrographically, leaves much to be desired. Scheid,¹ of Germany, and Jones,² of England, have claimed that they can specifically identify these particles by petrographic methods. Most petrologists on this continent claim that the identification of such fine particles is a petrographic impossibility. Knopf³ states: "When the individual particles are of the order of magnitude of 5 microns in diameter, petrographic examination of the material must be supplemented by other methods because the minimum grain size that can be conclusively identified under the petrographic microscope is about 10 microns in diameter."

* Read before the Section of Medicine, Toronto Academy of Medicine, on March 13, 1934.



FIGS. 1, 2, 3.—Early silicotic nodule in a mediastinal lymphatic gland of a rabbit dusted experimentally with silice. FIG. 1.—Serial section 1 photographed between crossed Nicol prisms. The doubly refractive material is not indicative of the siliceous content as shown by incineration and acid treatment of the ash (Fig. 3). FIG. 2.—Serial section 1 stained with hematoxylin and eosin and photographed with ordinary light. FIG. 3.—Serial section 2 incinerated and the ash treated with concentrated hydrochloric acid to remove any non-siliceous ash.

FIGS. 4, 5, 6.—Serial sections of a silicotic lung with an associated tuberculous infection. The upper nodule is an area of perivascular siliceous fibrosis and the lower nodule is an area of tuberculous fibrosis. FIG. 4.—Serial section 1 incinerated only, note difference in the ash of the two areas. FIG. 5.—Serial section 2 stained with hematoxylin and eosin. FIG. 6.—Serial section 3 incinerated and acid-treated to remove the non-siliceous ash. Note the differentiation of the two lesions by this treatment.

The molecular structure of powders can be determined by means of roentgen-ray absorption bands, and this method may prove to be accurate in such a determination. Chemical assay can only express the total siliceous material present in terms of silica, which may be either innocuous or harmful, or both. In the author's opinion, much of the doubly refractive siliceous material demonstrable by crossed Nicol prisms, even in areas of siliceous fibrosis, is innocuous, and is present in the form of silicates that accompanied the inhalation of the harmful silica.

The chemical theory of the etiology of silicosis is that the harmful siliceous material is silica that in the tissues becomes hydrated, and as such is responsible for the subsequent fibrosis at that site. If this theory is accepted, as it is by most authorities, the harmful siliceous material (hydrated silica) cannot be demonstrated in the usual histological section, as it is not particulate or doubly refractive.

To recapitulate. (a) Lung fibrosis may be present without any siliceous content. (b) Siliceous material may be present in lung tissue or the pulmonary lymphatic channels without an associated fibrosis. (c) Finely particulate siliceous particles from lung tissue cannot be identified by the present methods as specific silicon compounds but must be grouped merely as siliceous material, *i.e.*, innocuous silicate particles cannot be distinguished from harmful silica particles. (d) Hydrated silica, not being doubly refractive, cannot be demonstrated with crossed Nicol prisms. A consideration of these difficulties will reveal the fact that in the stained histological section the presence of siliceous fibrosis can be suspected but cannot be specifically identified with the siliceous material that it may contain.

With these considerations in mind, lung tissues from various types of pneumoconioses were studied to ascertain the amount and relation of siliceous material present in the tissues to the histological structure in which it was contained. This was accomplished by the microincineration of paraffin sections and the treatment of the ash with concentrated hydrochloric acid to remove the non-siliceous material (see preceding article). By the use of serial sections (Figs. 4, 5, 6) the tissue ash can be definitely related to histological structure. The lung tissues from ten gold miners, a coal miner, an iron miner, a Scotch stone cutter, a sandblaster, an abrasive soap

worker, and twelve rabbits with silicotic lesions produced by experimental dusting with silica, were examined. In the human lungs the chemical assay for siliceous material was relatively high, and, microscopically, there was much nodular fibrosis, shown by microincineration to be associated with a high content of siliceous material. Most of the human cases had an accompanying tuberculous infection.

Iron present in the tissues is unmasked by incineration and is present as red iron oxide. This oxide may represent inhaled iron compounds or the oxidation of endogenous blood pigments, as shown by Policard and his associates.⁵ Iron from both sources was most probably present in the lungs examined, but it was interesting to note that the siliceous lesions in the rabbits that had been dusted with silica contained only traces of iron. The lung tissue of the iron miner contained large amounts of iron, most of which was associated with the siliceous material contained in fibrous nodules. Many alveolar phagocytic cells contained large amounts of iron which was or was not associated with siliceous material. The other human lungs contained smaller amounts of iron that was associated with the siliceous material. The author is of the opinion from his observations that the iron associated with siliceous material contained in fibrous tissue is mainly of exogenous origin and is an indication of the iron content of the inhaled dust. Iron present in alveolar phagocytes and not associated with silica is probably endogenous in origin. Moderate amounts of grey ash soluble in acid and not doubly refractive were constantly associated with the siliceous material in the lungs examined. In the rabbit lungs and the lungs of the abrasive soap worker, representing acute silicosis, there were only small amounts of this grey ash associated with the siliceous material. This ash represents the acid-soluble compounds present in the tissues, for the most part probably calcium, sodium and magnesium compounds. In this study, as had been observed previously,¹ the amount of hydrochloric acid insoluble ash in the incinerated sections was a quantitative index of the siliceous assay of the corresponding tissue.

The amount of doubly refractive material seen in the stained sections did not bear any constant relationship to the siliceous material demonstrated in similar areas by microincineration and acid treatment of the ash. This was very obvious in the coal miner's lung, where the

siliceous material is rendered opaque by the associated coal dust. In the rabbit lesions no associated opaque material (Fig. 2) was present, but very little doubly refractive material (Fig. 1) could be seen, though incineration and acid treatment revealed relatively large amounts of siliceous material (Fig. 3). As practically no finely particulate foreign material could be seen in these lesions by direct illumination with transmitted light, the siliceous material was in all probability hydrated to the extent of not being doubly refractive. In the nodules showing hyaline degeneration, especially in the lungs of the gold miner, only a few doubly refractive particles could be demonstrated in the stained sections, but these areas could be shown to contain large amounts of siliceous material when incinerated. Hydration of the siliceous material is again the probable explanation. The number of doubly refractive particles seen in the stained sections in areas of typical siliceous fibrosis was fairly indicative of the amount of siliceous material demonstrable by incineration.

The amount of siliceous material present in the typical siliceous nodules, demonstrated by incineration and acid treatment, was surprisingly constant in all nodules in any one lung. In the lungs in which there was a history of long dust exposure this variation from lung to lung was slight. The lung of the abrasive soap worker was an exception, in that the fibrous nodules were not as dense in structure and contained less siliceous material than the siliceous nodules in the lungs having a history of long exposure to dust.

The ash content of the areas of fibrosis seen in this series of lungs was apparently indicative of the pathogenesis of those lesions. The experimental rabbit lesions were not complicated by tuberculous infection. An examination of the incinerated acid-treated sections of these lungs clearly demonstrated all areas which in the corresponding stained sections revealed fibrosis that had the appearance of being siliceous in origin. The siliceous material was present in relatively large amounts and was distributed uniformly throughout the lesions. The siliceous material was sharply defined by the limits of the fibrous reaction (Figs. 2, 3, 5 and 6). The human lungs presented many fibrous areas having a siliceous ash similar to those seen in the

rabbit lungs, except that the amount of siliceous material present was greater per unit area. The arrangement of the siliceous ash in such areas was much the same as the fibrous tissue in which it was contained. Areas of obvious tuberculous fibrosis presented an ash much less dense (Fig. 4) than the ash of siliceous nodules. This ash when treated with acid disappeared either entirely or partially (Fig. 6), leaving a few scattered siliceous particles. Areas of degenerated tissue of uncertain origin presented ashes of varying appearance and composition. Some of these presented a siliceous ash typical of the nodules of siliceous fibrosis. Others contained no siliceous material or a few scattered particles similar to those seen in the acid treated ash of areas of tuberculous fibrosis.

The ash pattern of definite silicotic nodules is so typical and constant, that the author infers that if such an ash is present it represents a silicotic nodule, even if the corresponding area in the stained section has degenerated beyond recognition. If an area of ash does not contain any siliceous particles or contains only a few scattered siliceous particles, he also infers that such an ash represents an area of non-siliceous fibrosis.

In conclusion, the author is of the opinion that in microincineration we possess the best method of relating histological structure to siliceous material present in any tissue. Microincineration should be regularly included in the microscopic examination of any lung where siliceous fibrosis is suspected, not with any dogmatic predictions in mind but rather as a means towards a surer diagnosis and a better understanding of the pathogenesis of siliceous fibrosis.

The author wishes to thank Dr. F. G. Banting for his constant help and suggestions and Dr. J. G. Cunningham, Division of Industrial Hygiene, Ontario Department of Health, for placing at his disposal the human material used in this study.

REFERENCES

1. SCHEID, K. F.: Über die Methodik der Darstellung und Bestimmung des in pneumokoniotischen Geweben abgelagerten Staubes, *Beit. z. path. Anat.*, 1932, 89: 93.
2. JONES, W. R.: Silicotic lungs; minerals they contain, *J. of Hyg.*, 1933, 33: 307.
3. KNORR, A.: Quantitative determination of quartz (free silica) in dust, *Pub. Health Rep.*, 1933, 48: 183.
4. IRWIN, D. A.: Histological demonstration of siliceous material by microincineration, *Canad. M. Ass. J.*, 1934, 31: 135.
5. POLICARD, A., DUBROW, S. AND PILLET, D.: Application de la technique histologique de la microincinération à l'étude des juments anthracosiques pulmonaires, *Bull. Acad. Natl. Méd. Sec. de Biol.*, 1928, 83: 9-5.

RIEDEL'S STRUMA WITH A REPORT OF SEVEN CASES*

By DAVID EISEN, M.B., M.Sc.(Med.),

Toronto

IN 1896 Riedel¹ reported 2 cases of a hitherto unrecognized disease of the thyroid gland. Both his patients presented themselves with a very hard enlargement of the gland which he regarded as malignant. At operation this suspicion seemed to be confirmed by the finding of an indurated, infiltrative mass involving the thyroid, the perithyroid tissues, and the large vessels and nerves of the neck. Riedel was able to do only a partial resection. Histologically, the excised tissue showed only a diffuse fibrosis and round-cell infiltration. Both patients recovered. Riedel regarded the condition as inflammatory in nature, and, impressed by its marked induration, named it "iron-hard thyroiditis". In the course of the next fifteen years 10 such cases were reported under various names by other writers.

In 1912 Hashimoto² published a series of 4 cases which resembled those of Riedel clinically. Histologically, however, these showed a more dense round-cell infiltration and, in particular, the formation of aggregated lymphoid follicles with germinal centres. Because of the latter finding, he considered his cases to represent a clinical entity quite distinct from Riedel's struma. In 1922 Ewing³ demonstrated that Hashimoto's struma was not a clinical entity but merely an early stage of Riedel's struma. Hashimoto's claims have remained unsupported until quite recently, in 1931, when Alan Graham⁴ attempted to revive them. The present consensus is, I believe, to regard Riedel's struma and Hashimoto's struma as of the same nature, and I shall refer to them as such.

Riedel's struma is an infrequent disease. Its rarity, in fact, is one of its outstanding characteristics. An intensive search of the literature up to July, 1932, reveals only 82 definitely proven published cases. Through figures furnished me by various surgical clinics throughout the continent I have been able to obtain statistics on 46,469 thyroidectomies. Among this number

only 96 cases of Riedel's struma occurred, that is, about 0.20 per cent.

Like other types of thyroid enlargement this disease shows a strong predilection for the female sex. Seventy-two per cent of the cases occurred in women. Its incidence is most frequent in the fifth decade, the average age being 44. It has occurred, however, as early as 23 and as late as 78 years of age.

The pathogenesis of the disease remains obscure. Riedel regarded it as an inflammatory process and this is still the common opinion. Some attempts have been made to relate it to infections in the mouth and upper respiratory tract.⁵ Ewing believes the condition to represent a granuloma of a benign type. The latest theory is that of Williamson and Pearse⁶ who regard it as a "lymph-adenoid goitre" a form of abnormal involution of the thyroid, the lymphocytic infiltration representing a failure at hyperplasia. Attempts to demonstrate a tuberculous or syphilitic basis for the condition have been abandoned.

The outstanding clinical symptoms are the presence of a goitrous mass in the neck associated with dyspnoea, occasionally hoarseness, and, possibly, mild hyperthyroid symptoms. Less frequently there is pain along the side of the neck and difficulty in swallowing. The general health is seldom disturbed.

On examination it is found that there is little evidence of systemic involvement. The enlargement of the thyroid may be symmetrical or may be more apparent in one lobe. The involved mass may vary in size from that of a hazel-nut to a large mass extending along the vessels to the base of the skull and downwards into the mediastinum. Cases of such extensive involvement have not been reported by the later writers, probably because patients now appear for operation earlier. The surface of the gland is apt to be smooth and of a characteristic firm induration which has been compared to that of wood (woody thyroiditis) or iron (Riedel). In about half of the reported cases, particularly those of

* Read before the Section of Surgery, Academy of Medicine, Toronto, on December 19, 1933.

the early writers, the gland was fixed or showed decreased movement on swallowing.

The average basal metabolic rate is about plus 10. Some late cases, however, appeared with a definite myxœdema. The blood Wassermann test is uniformly negative. The urine is usually normal. The blood count and the blood chemistry, wherever recorded, show no abnormality.

In addition to the more ordinary types of goitre the disease must be differentiated from cancer, infectious thyroiditis, tuberculosis, syphilis and actinomyces of the thyroid, and from "woody phlegmon" of the neck. Fully 66 per cent of the 82 reported cases were mis-diagnosed clinically as some form of malignancy of the thyroid. In a case reported by Balfour this diagnosis was even confirmed by pathological examination, but subsequently proved incorrect by the further behaviour of the patient. In only five cases was a clinical diagnosis of Riedel's struma correctly made. In view of this it might be worth while to exclude Riedel's struma in a case where a diagnosis of cancer of the thyroid is being considered.

Time does not permit of a detailed discussion of the differential diagnosis, but a few of the salient features characteristic of Riedel's struma might be mentioned. The thyroid gland is extremely hard and usually smooth, and occasionally fixed. The regional lymph nodes are not enlarged. There is no engorgement of the vessels of the neck or chest. There is no evidence of suppuration in the thyroid, and the skin is not adherent to the underlying tissues. Dysphagia and pain are comparatively rare. There is no disturbance of the patient's general health.

In the treatment of the disease no medicament has proved of any value. Some subjective improvement and decrease in the size of the mass have been noted following roentgen and radium therapy. The standard treatment, however, has been surgical—usually a partial resection of both lobes. In many cases the operation is rendered difficult by dense and extensive adhesions between the thyroid and the perithyroid muscles and, occasionally, the large vessels and nerves of the neck.

There appears to be a tendency to spontaneous regression of a large mass following a small resection. This was first noted by Riedel. Of late the disease is beginning to be regarded as self-limited, leading either to recovery or to

ultimate hypothyroidism. If this is true, then operation would tend to favour an ultimate myxœdema. It has been suggested, therefore, that, if malignancy can be clinically excluded, operation, except possibly for biopsy purposes, might be best avoided. About 75 per cent of the cases operated on were considered to be improved. Post-operative hypothyroidism resulted in 45 per cent of the cases. In 15 per cent there was recurrence of the disease anywhere up to five years after the operation. These results do not seem to have depended upon the amount of tissue excised. There was an immediate operative mortality of 6 per cent.

The pathology of this disease is of unique interest and forms the real basis for considering it a distinct entity. The condition begins locally in the thyroid. Later, it may involve the perithyroid muscles and fascias and the structures of the carotid sheath. These structures become infiltrated by a smooth, fibrous mass, the cut surface of which is of a greyish-yellow colour. The tissue has a characteristic hard consistency, so that the fresh specimen may feel as if it had been hardened in formalin and creaks under the knife. The cut surface is fibrous and the normal lobulations are destroyed.

Microscopically, the condition is characterized by a diffuse fibrosis. In addition, there is an extensive infiltration of the tissue with lymphocytes and endothelial cells, with a smaller number of plasma cells and occasionally eosinophiles and polymorphonuclears. The more advanced cases show a less prominent round-cell infiltration and more extensive fibrosis. The Hashimoto type of this disease is characterized by a less prominent fibrosis and a more diffuse round-cell infiltration associated with the formation of lymphoid follicles. There is morphological evidence that a transition from the Hashimoto to the Riedel type is possible. In both types of the disease the normal thyroid alveoli undergo an hydropic degenerative process, becoming ultimately replaced by fibrous tissue. The colloid undergoes phagocytosis and ultimately disappears. Side by side with this destructive process there takes place a regeneration leading to the formation of hypertrophic and hyperplastic epithelial cells which tend to form islands of small, round fetal-looking alveoli or cell clusters surrounded by fibrous tissue. These new cells, which, morphologically, may be mistaken for cancer cells, have been shown to

have a compensatory function and may help to carry on a normal metabolism, leading ultimately to a regression of the disease. More often, however, they also undergo degeneration and are replaced by fibrous tissue. Pseudo-giant cells are frequently found and have at different times caused this condition to be considered tuberculous or syphilitic in nature. They are not, however, true giant cells, but are formed by a syncytium-like formation of the clusters of the newly-formed epithelial cells or by the desquamated acinar cells which arrange themselves peripherally about the colloid in the alveolus.

The cases that I am reporting on were seen by me at the Long Island College Hospital, New York, in the service of Dr. Emil Goetsch. Six of the 7 patients were women. The youngest was 38, the oldest 56, and the average age was 47. The duration of the disease varied from 2 months to 3 years, averaging 10 months. In 2 cases the condition was superimposed upon a pre-existing goitre, which in one case had been present as long as 28 years.

The symptoms common to all the patients were dyspnoea and a mass in the neck. Five of the patients showed mild hyperthyroid symptoms, 2 showed evidences of some hypothyroid-

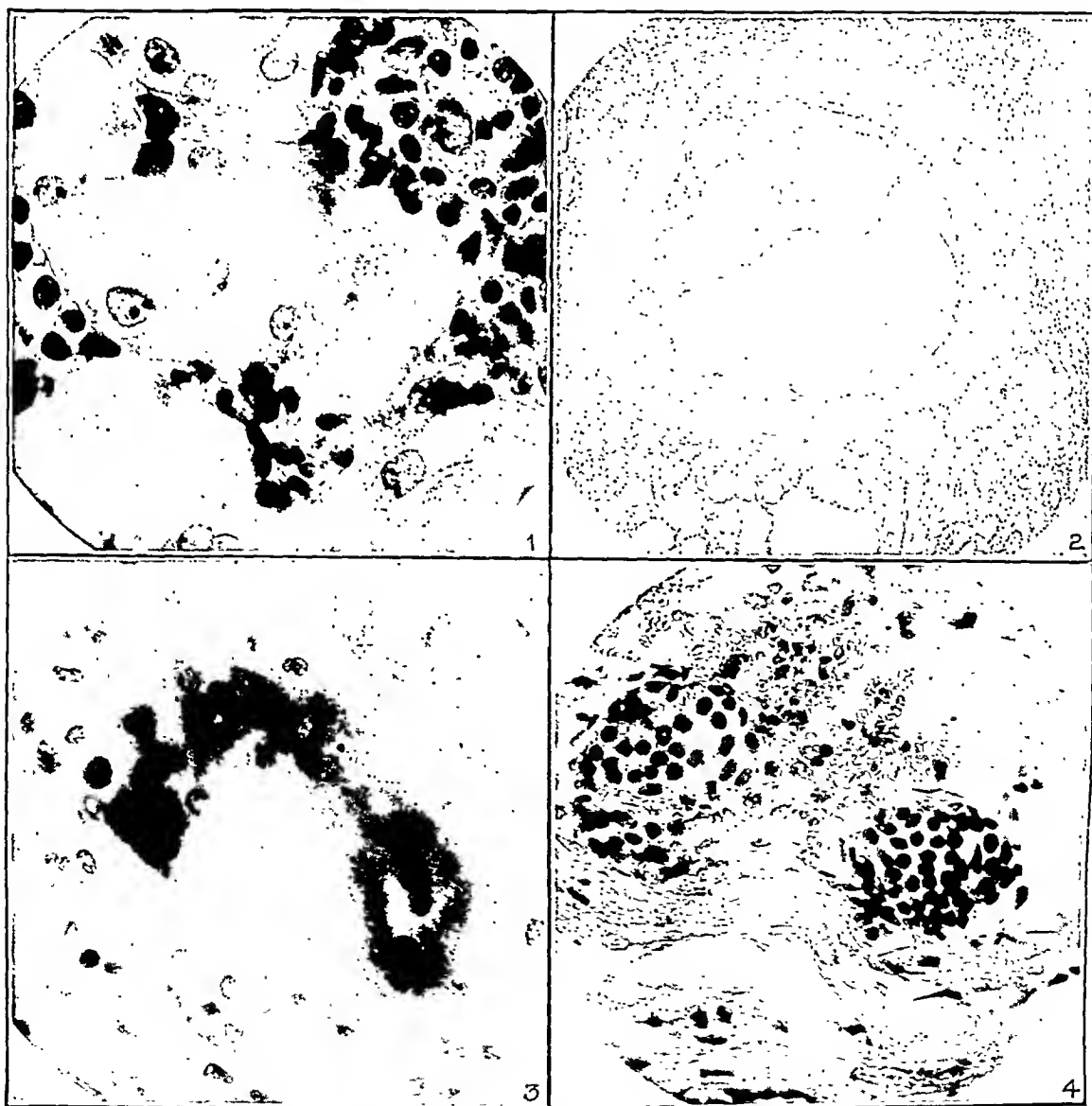


FIG. 1.—Typical hydropic degeneration of acinar cells. Infiltration of small lymphocytes, endothelial cells, plasma cells. This represents an early stage of Riedel's struma—the "Hashimoto" type.

FIG. 2.—Group of acini completely isolated by marked and extensive fibrosis. Surrounding follicles compressed. This represents a later stage—the Riedel type proper.

FIG. 3.—Pseudo-giant cell of "colloid type" containing nuclei of desquamated epithelial cells and endothelial cells. Surrounding it are lymphocytes, endothelial cells and plasma cells.

FIG. 4.—Pseudo-giant cells of the "epithelial type" due to a syncytium of clusters of newly formed interacinar epithelial cells.

ism. Two complained of some difficulty in swallowing, 1 of chronic hoarseness, and 2 of pains in the neck radiating upwards to the mastoids. In 2 of the cases there was a history of infection (cold, ear infection) immediately preceding the onset of the disease.

The pulse averaged 89. Aside from this the findings were negative, except for those in the neck. In all the thyroid was found enlarged and unusually firm, almost stony hard in some cases. In none was the gland fixed. The involvement was symmetrical in 5 cases, but in 2 of these the right lobe was larger than the left.

Three of the cases were diagnosed adenomatous goitre, because of nodules which could be felt on clinical examination. Subsequent pathological examination confirmed the presence of these adenomata, but these were in no instance found involved in the pathological process. Three cases were considered as having Graves' disease with marked fibrosis. In 1 patient a diagnosis of Riedel's struma was made, but a strong suspicion of cancer was entertained

because of the marked induration. A double resection was done in all the cases, the average amount of tissue removed being 25 grm. Pathological examination revealed in 4 cases the findings characteristic of Riedel's struma and in 3 of Hashimoto's struma.

Five of the 7 patients developed hypothyroidism, with an average basal metabolic rate of minus 17, the lowest being minus 37. At the time of the last observation, in March, 1933, there were no recurrences and no deaths. The oldest case had been operated on 8 years previously.

REFERENCES

1. RIEDEL, B. M. C. L.: Die chronische zur Bildung eisenharter Tumoren fuhrende Entzuendung der Schilddruese, *Verhandl. d. deut. Gesell. f. Chir.*, 1896, 25: 101.
2. HASHIMOTO, H.: Zur Kenntniss der lymphomatoesen Veraenderungen der Schilddruese (Struma Lymphomatosa), *Arch. f. klin. Chir.*, 1912, 97: 219.
3. EWING, J.: *Neoplastic Diseases*, 2nd ed., Saunders, Phila., 1922, p. 908.
4. GRAHAM, A. AND McCULLAGH, E. P.: Atrophy and fibrosis associated with lymphoid tissue in the thyroid, *Arch. Surg.*, 1931, 22: 548.
5. BOHAN, P. T.: A case of ligneous thyroiditis associated with high grade dental infection, *Med. Clin. N. Am.*, 1923-24, 7: 1069.
6. WILLIAMSON, G. S. AND PEARSE, I. H.: The pathological classification of goitre, *J. Path. & Bact.*, 1925, 27: 361.

THE RELATIONSHIP BETWEEN RIEDEL'S STRUMA AND STRUMA LYMPHOMATOSA (HASHIMOTO)

By DAVID EISEN, M.B., M.Sc.(MED.),

Toronto

IN 1896 Riedel^{1, 2, 3} called attention to a hitherto unrecognized disease of the thyroid gland characterized by marked enlargement and induration, with extensive adhesions involving the large vessels of the neck. Clinically the condition resembled malignancy, but, histologically, the excised tissue showed a marked fibrosis and round-cell infiltration, which Riedel regarded as indicative of an inflammatory process. Within the course of the next fifteen years similar cases were reported by other writers (Tailhefer,^{4, 5} Ricard,⁶ Berry,⁷ Poncet and Leriche,⁸ Silatschek,⁹ Spannaus,¹⁰ Delore and Alamartine,¹¹ Kuettner¹²).

In 1912 Hashimoto¹³ published a series of 4 cases which resembled the above clinically, but on histological examination showed, in addition to the usual round-cell infiltration, the formation of lymphoid follicles with germinal centres. Since he could find no mention of this latter finding in the reports of the previous writers

Hashimoto believed that he was dealing with a new disease of the thyroid to which he gave the name of "struma lymphomatosa".

Little notice was taken of Hashimoto's work until Ewing,¹⁴ in 1922, focussed attention on it by his opinion that Hashimoto's struma was not an entity, but represented merely an early stage of Riedel's struma. Ewing's views received general acceptance until recently, when apparent contradictions began to appear from various sources. In 1927 Perman and Wahlgren¹⁵ published the case of a patient who had been re-operated on for a recurrence of Riedel's struma eighteen months after his original operation. The specimen removed at the second operation was histologically similar to that of the first, with the exception that the round cells were fewer and the fibrosis more prominent. The writers maintain that, in this case at least, Riedel's struma was not preceded by struma lymphomatosa. Opposed to this, however, was

a parallel case published by Heyd¹⁶ two years later. While the material removed at the first operation was typical of Hashimoto's struma, a specimen removed thirteen months later showed a marked reduction in the number of lymphocytes and an increased fibrosis, suggesting an approach to the Riedel type.

In 1931 a serious challenge to Ewing's view appeared in a paper by Graham.¹⁷ This writer collected from the literature 16 cases of what he considered to be struma lymphomatosa. To these were added Hashimoto's original 4 cases and 4 others previously reported by Graham and McNallagh.¹⁸ For purposes of comparison, Graham culled from the literature another series of 41 cases that he deemed to be true Riedel's struma. As contrasted with Riedel's struma, Graham found that Hashimoto's struma occurred almost exclusively in females, had a higher age-incidence, and that the duration of symptoms at the time of the first examination was twice as long. Bilateral involvement was found in all of the cases in the Hashimoto series and in only one-half of the Riedel group; hypertension in one-fifth of the former and in none of the latter. Diffuse cervical cellulitis occurred in three-quarters of the Riedel cases and in none of the Hashimoto group. Post-operative mortality and hypothyroidism were also more frequent in the Riedel group. From the above, Graham concludes that there is no relationship between the two conditions. He regards Riedel's struma as essentially a local condition of unknown etiology, wherein any constitutional effects are incidental to the strategic position and function of the thyroid. Hashimoto's struma he believes to be a general disorder with local manifestations in the thyroid.

Graham's views are largely concurred in by Joll¹⁹ who was unable to find lymphoid follicles in any of his 8 cases. Williamson and Pearse,²⁰ on the other hand, make no distinction between those cases that show lymphoid follicles and those that do not, but regard them all as types of lymphadenoid goitre built up on an involutional basis.

It would seem to the present writer that some of the above views are open to criticism. Perman and Wahlgren's findings might lend themselves to an interpretation different from that proposed by them. The increased fibrosis and the decrease in the number of lymphocytes in this, as in Heyd's case, might be taken to in-

dicate a dynamic process in the course of which the original round-cell infiltration undergoes fibrous replacement. The fact that the first specimen did not show the histological picture of Hashimoto's struma does not prove that such findings might not have met at an earlier stage of the disease.

Graham's arguments are open to the criticism that in only 4 of the 24 cases that he presents as typical of Hashimoto's struma was the pathological specimen actually studied by him. The 16 cases culled from the literature appear to have been diagnosed entirely from the published data, in spite of the fact that the original authors reported them as Riedel's struma. Graham does not state by what criteria he differentiated the two conditions. Assuming for the moment that all of the above cases were actually of the Hashimoto type, one might still offer the objection that 24 cases are an insufficient number by which to estimate statistics of any value. This is aptly illustrated in the following instance. Among the first 15 cases of Riedel's struma reported (up to 1912) there were only 4 females, so that Heineke,²¹ writing in 1914, stated that "the disease occurs twice as often in men as in women." The next 16 reported cases all occurred in women (!) thus changing the female sex incidence from 26 to 64 per cent! Since Graham's thesis is built up largely upon a statistical basis, this criticism would appear fundamental.

A review of the original sources of the cases quoted by Graham confirmed his finding that the average age of the cases that he placed in the Hashimoto group was greater than that in the Riedel group. This would make it illogical to assume that the former disease is an early stage of the latter. It does not, however, exclude the possibility of such a transition under exceptional circumstances. In both types there has been recorded a tendency to spontaneous regression.^{3, 13} The absence of hypertension in the reported cases of the Riedel type was confirmed, with the observation, however, that in very few of these was there any record whatever as to the blood pressure; undoubtedly some cases were not recorded. The frequency of some degree of cervical cellulitis in the quoted cases of the Riedel type was also confirmed. It seems difficult to understand, however, how the presence of extracapsular involvement escaped being recorded by Graham in his 24 collected cases of

the Hashimoto type in at least 4 of which (Shaw and Smith, Cases 5 and 6;²² Smith and Clute, Case 1;²³ Wingate, Case 1,²⁴) there was a definite positive statement as to such involvement.

I have had the opportunity, in the past two years, to study 7 cases of Riedel's struma,²⁵ 3 of which were of the Hashimoto type. The criterion for this latter diagnosis was the presence on the microscopic slide of these cases of lymphoid follicles with germinal centres. The clinical findings were similar in both types of the disease. All were operated on, and the excised material subjected to microscopic study.

The average age in each group was 50. Contrary to Graham's experience, a slight degree of hypertension, at least, was found in two of our Riedel cases (144-90; 154-100); in addition, 2 of our 3 cases of the Hashimoto type showed definitely increased adhesions between the thyroid capsule and the ribbon muscles. Post-operative hypothyroidism was found in 3 patients in each group. Associated adenomata were found in 1 of our Hashimoto group and in 2 of the Riedel type; in no case were these adenomata involved in the process.

It would seem from the above that it would

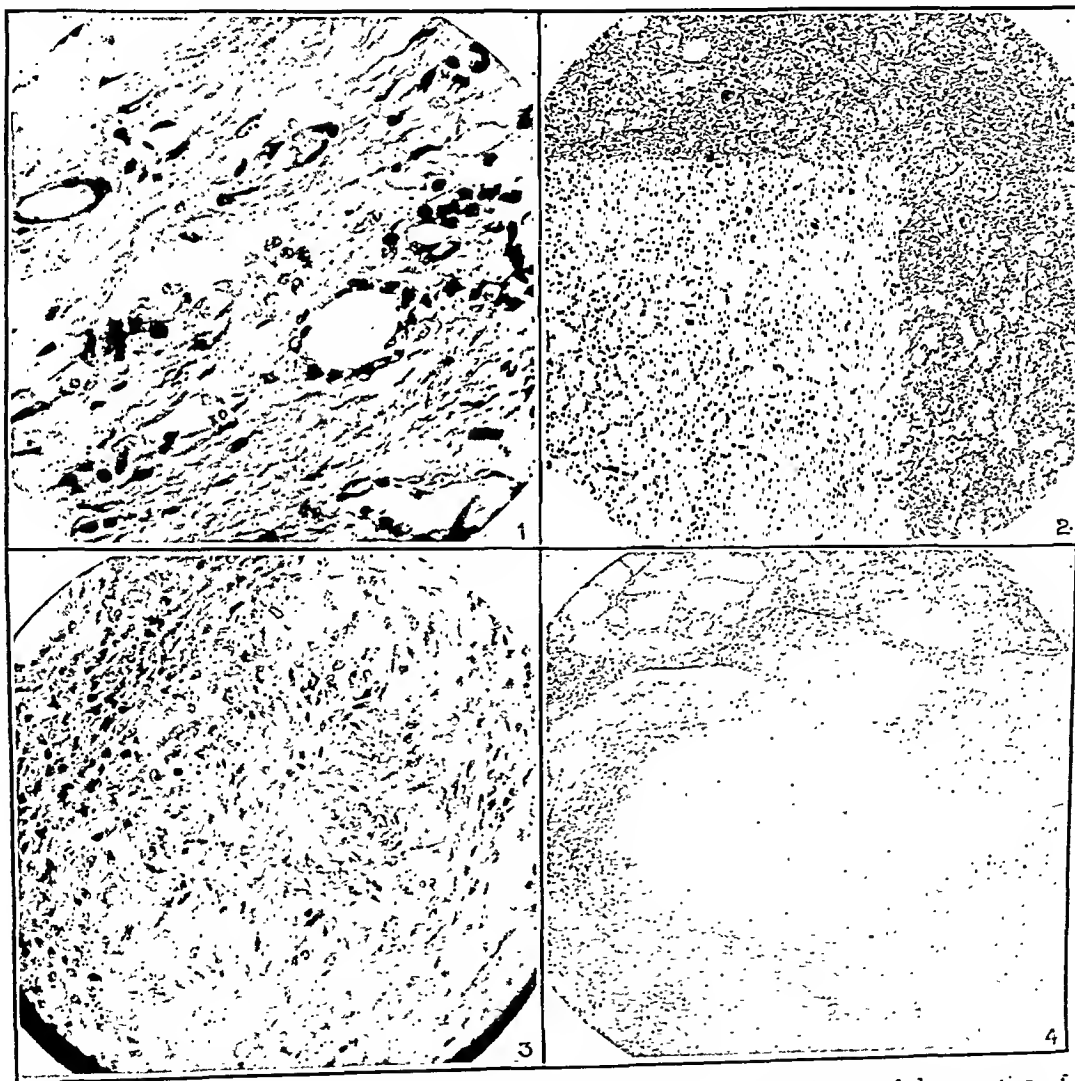


FIG. 1.—Riedel's struma. Diffuse fibrosis. Small isolated acini. Evidences of degeneration of epithelial cells near centre. Few lymphocytes. (High).

FIG. 2.—Hashimoto's struma. Diffuse round cell infiltration. Lymphoid follicles with germinal centres. Small round acini. Small amount of fibrous tissue. (Low).

FIG. 3.—Lymphoid follicle. The germinal centre is completely fibrosed. The lymphocytes show beginning invasion by fibroblasts.

FIG. 4.—Large, irregular lymphoid follicle with disproportionately large germinal centre most of which appears to have undergone necrosis. This may illustrate another process by which these bodies disappear.

the kidney has presumably become progressively destructive, bladder invasion and extension to the genital tract in the male, involving the prostate, seminal vesicles and epididymes, with or without concomitant activation of a focus elsewhere in the body. The clinical recognition of cystitis in a young or middle aged individual, in whom urethral infection can be definitely excluded, which is progressive although manifesting repeated remissions, and which resists the ordinary medications such as internal remedies and topical applications to the bladder for a month or more, should be immediately investigated from the standpoint of urinary tuberculosis.

Let us consider briefly the pathological anatomy and the nature of the bacterial invasion of the kidney by the tuberculous process. In the past we have been taught to regard renal tuberculosis as a unilateral progressively destructive disease, involving in turn the cortex, medulla, and pelvis of the kidney, which tends to spread to the lower part of the urinary tract and even to the genitalia, and that the involvement of these structures can only be avoided if the kidney is removed in the early stages. In the light of recent clinical and experimental work this conception demands revision, if not wholly, at least in part. We owe to E. M. Medlar⁶ a debt of gratitude for his painstaking work in studying the pathological manifestations of renal tuberculosis in the human and in animals. He contends that renal tuberculosis with cavitation, recognized clinically as surgical tuberculosis, corresponds to a late stage of the disease, and that the pathological processes thus exhibited afford little opportunity for study of its early manifestations. By far the majority of renal tuberculous lesions are diagnosed at this stage, when there are no apparent clinical manifestations of the disease elsewhere, and on that account it is obviously regarded as a progressively destructive lesion which does not heal. Accordingly, Medlar studied renal tuberculosis in the kidneys of patients dying from pulmonary tuberculosis and in those who had as yet no symptoms referable to the urinary tract. He demonstrated the preponderance of cortical lesions, which comprised 75 per cent of all those encountered, and determined that they were inflammatory rather than destructive in nature, with very little tendency towards abscess formation, caseation,

or extension to the neighbouring cortical parenchyma or medulla of the kidney. The lesions in the remaining 25 per cent were about equally distributed in the cortico-medullary area in close proximity to the arcuate arteries and the medullary segment, and of these the latter were the more destructive. These findings were a radical departure from the accepted belief that the initial lesion was usually to be found in the apices of the pyramids, situated in the medulla at a point referred to clinically as the niche of the minor calyces.

Helmholtz⁴ demonstrated the glomerular incapacity for bacterial filtration in the normal state and in non-tuberculous renal infections. Medlar corroborated these findings and demonstrated the non-existence of excretory bacilluria without evidence of ulcerative tuberculous lesions in the kidney. He ascribed the erroneous belief in excretory bacilluria to the fact that the lesions were microscopic in size and therefore often overlooked. It is possible that tubercle bacilli may pass through the kidneys and appear in the urine without causing symptoms referable to the urinary tract, and in all likelihood many cases of early renal tuberculosis go undiscovered and heal before destruction occurs. Harris,³ in a recent communication, reported the study of urinary findings in adults and children suffering from bone, joint and soft-tissue tuberculosis, and he pointed out the frequency with which tubercle bacilli were found despite the absence of clinical symptoms referable to the urinary tract. He also reported that in about half of the cases investigated by urological methods the bacilli were of renal origin. In some of the cases examined renal lesions subsequently developed, in others lesions were discovered post mortem, whereas in the remainder no clinical symptoms developed and we must assume that the lesions had healed. Thomas reported a similar experience with patients who were inmates of the Glen Lake Sanatorium in Minnesota.

Among the earliest changes demonstrated were lesions indicative of glomerulonephritis or nephrosis indistinguishable from those described by Vollhard and Fahr,⁵ with the exception that tubercle bacilli and giant cells indicated their specific nature. These were often found in conjunction with more advanced tuberculous changes. During life such lesions would account for the appearance in the urine of

albumin, casts, pus and in the hæmorrhagic form blood cells. They were most frequently encountered in the capillary tuft and also around the small arterioles between the tubules. If only a few bacilli invade the renal tissue there will be no caseation or ulceration, and likewise no pus or bacilli in the excreted urine, but if there are repeated bacteriæmias, which is certainly the case when there is an active focus in the chest or elsewhere, caseation and ulceration will develop with the appearance of tubercle bacilli in the urine.

Wildbolz,¹¹ of Berne, than whom there is no greater exponent on urinary tuberculosis, in commenting on these findings, suggests that they are miliary tuberculous metastases rather than true tuberculous lesions. He differentiates the fibrotic or indurative type of lesion, and the nodular form, in which tubercles caseate but do not proceed to renal cavitation as in the ulcerocavernous variety. He regards evidences of nephritic change as non-specific in nature, and very diplomatically dodges the issue involved by asserting that certain lesions revealed by other investigators were so minute and insignificant that they failed to produce clinically active symptoms during life, and therefore cannot be regarded as representative of the true pathological picture encountered in renal tuberculosis.

Clinically, it is conceded that the size and site of the tuberculous lesions in the renal tissue, plus the constitutional and local resistance of the individual, will determine whether a given patient will develop an inflammatory non-destructive lesion or a frankly destructive lesion demanding surgical removal. Surgical renal tuberculosis such as that encountered by the majority of general surgeons comprises only about 25 to 30 per cent of the actual number of cases of renal tuberculosis. Actually the disease develops because of a previous bilateral hæmatogenous invasion of tubercle bacilli into the renal tissue. Whereas published reports appraise the incidence of bilateral involvement as between 20 to 25 per cent, and in Wildbolz's series of over 1,000 cases only 12 per cent, the remainder being unilateral and in the absence of definite contraindications amenable to surgery, carefully studied series of cases representing the earlier lesions of urinary tuberculosis show bilateral involvement in no less than 65 per cent of cases. Thomas⁸ reported bilateral disease in 57 per cent, and remarked that, since all renal infec-

tions in which tubercle bacilli are found in the urine are hæmatogenous in origin, both kidneys are originally equally infected, and therefore bilateral disease was the rule. However, there is a possibility that the lesions in one kidney may heal, leaving those in the other to progress and develop into the destructive type of lesion encountered clinically. Unquestionably, bilateral involvement is the rule in the advanced stage of the disease and in children and the coloured races who are markedly susceptible to its inroads.

How then are we to account for the apparent discrepancy in the incidence of bilateral involvement in the early and late renal lesions? No doubt a number may be accounted for by incomplete urological study and conclusions reached prematurely, possibly after a single examination, because it is well known that even with open lesions tubercle bacilli may only appear in the urine in showers corresponding to the invasion of the blood stream by a focus in the chest or the ulceration of a renal lesion into the collecting portions of the kidney. It is my belief, however, that the numerical difference is or may be accounted for by the complete healing of early inflammatory or non-destructive lesions. There are no authentic records of healed renal tuberculosis, but the majority of cases studied have been those of renal phthisis, and when the disease has been observed during the routine conduct of a post-mortem it has been automatically recorded as such without a thorough systematic study of the kidney for evidences of healed lesions. It may be of interest to note that Medlar studied 100,000 serial sections before making his initial report, and in many instances made as many as four to five hundred sections of a single block of tissue. Healing of a grossly cavitated kidney probably never occurs, but there is abundant evidence to prove that the disease may become arrested and there is no longer any doubt about the feasibility of spontaneous healing of an early non-destructive or inflammatory renal lesion. The nearest approach to healing recognized by the naked eye is the localization of a caseous focus by a dense fibrous capsule which shuts it off from the rest of the urinary tract, or the development of a ureteral stricture and the establishment of a status referred to clinically as "enclosed" renal tuberculosis, or, in the extreme, autonephrectomy of the involved kidney.

eration sometimes occurs, but seldom involves the whole lesion.

Contrary to the prevailing conceptions regarding the initial site of tuberculous involvement in the genital tract of the male, Kenneth Walker¹⁰ has conclusively demonstrated, both clinically and in experimental animals, the prostate and the seminal vesicles rather than the testes as the primary foci, either by hæmatogenous implantation or urogenous extension. In approximately 75 per cent of cases in which castration has been performed the disease has subsequently appeared on the opposite side. Renal tuberculosis can be demonstrated in the majority of cases. The lesions are probably slow in formation and have a tendency to remain localized for a number of years, but eventually they become manifest by an enlargement of the testicle which is then erroneously interpreted as the primary seat of the disease, whereas in fact this may have existed in the prostate for years.

It is important to bear in mind that tuberculosis may progress insidiously in the kidney. In non-tuberculous renal infections urological study has been responsible for a decided reduction in the necessity for surgery. The conduct of routine investigation for the source of pyuria and the prompt institution of a therapeutic régime with the aid of the ureteral catheter for drainage purposes have been responsible for this reduction. Greater efficiency and more searching study, if necessary on repeated occasions, would reveal earlier tuberculous lesions. When the cystoscopic examination reveals bladder changes which are slight or insignificant, the urographic findings are negligible or negative, and tubercle bacilli are found in only one kidney specimen; and in cases with indeterminate findings, both cystoscopically and by x-ray, a program of watchful waiting is certainly to be desired. Examination of the urine on repeated occasions is a matter of prime importance, since tubercle bacilli are found after diligent search in about 60 to 75 per cent of cases. In the completely closed type of lesion they may be absent unless there are open lesions in the bladder or prostate. When tubercle bacilli are found in one kidney specimen and none in the other, pyelography of the apparently healthy kidney should be performed before subjecting the patient to operation, since it may detect an early renal lesion. The earliest pyelographic

sign is a filling defect in the pelvic outline which corresponds to a tiny area of renal destruction and which is referred to clinically as a cortical abscess. Pronounced distortion of the pelvic or ureteral outline is indicative of gross destruction. Although the changes revealed following the injection of intravenous dyes such as neoskioldan may be indefinite, it is my belief that in the near future, when this phase of urography has been more highly perfected, it will afford the earliest evidence of tuberculous renal change.

In the light of recent clinical and experimental data it is apparent that every case of



FIG. 1.—Normal right kidney and tuberculous involvement of the left affecting the upper pole with stricture at the uretero-pelvic juncture. FIG. 2.—Retrograde pyelogram of left kidney confirming diagnosis, also demonstrating stricture and marked dilatation of the ureter. FIG. 3.—Operative specimen showing destruction involving upper pole and stricture indicated by arrow.

pulmonary tuberculosis is a potential candidate for urinary tuberculosis. In a series of cases recently studied evidences of healed or active lesions in the chest were demonstrated in 41 per cent, and there is little doubt that the remainder were concealed and defied detection. Clinical experience has shown that the early lesions of pulmonary tuberculosis are often found in patients who have few if any of the obvious pulmonary symptoms. This also applies to renal disease, so that a search for renal

tuberculosis must begin before symptoms of bladder involvement develop.

The recorded opinions of different surgeons vary on the question of the advisability of prompt removal of the tuberculous kidney. It must be borne in mind that nephrectomy for renal tuberculosis is seldom an emergency procedure, so that patients should be carefully selected and prepared for operation at the opportune time. We must not lose sight of the fact that tuberculosis is essentially a constitutional disease, and that surgery directed to a local manifestation in the kidney will not completely eradicate the disease, but is merely an aid in obtaining a clinical result. The patient should therefore be studied from several angles before deciding on nephrectomy, and a decision on the applicability of surgery must be based on an assessment of the individual case. It is a well-known clinical fact that a tuberculous person responds more slowly than others to surgical treatment, and on that account we must consider beforehand what bearing certain factors may have on his continued welfare, *e.g.*, lengthy hospitalization, with the danger of intercurrent infections, the debilitating influences occasioned by reopening of the incision when patients have little or no resistance to the disease, due to contamination of the wound from a perinephric formation, an incompletely sealed infected ureter, or a chronic slowly healing sinus, the danger of pulmonary complications in spite of spinal anaesthesia, which is most adaptable for this work, the possibility that the remaining kidney may be unable to compensate for the loss of its mate, and the uncertainty that his clinical symptoms will be completely arrested. When a patient fails to improve after operation it may be due to a concealed lesion in the apparently healthy kidney which was not recognized prior to nephrectomy, or he may have failed to muster sufficient resistance to combat the disease.

In the past patients who were the victims of pulmonary tuberculosis were considered unsuitable for surgical treatment. Many patients so handicapped were denied the benefits to be derived from surgery. In our day this attitude has possibly been more than counter-balanced by the swing of the pendulum towards radicalism, and we therefore frequently encounter evidences of ill-advised and injudicious surgical treatment. Recent or active pulmonary tuberculosis offers a very inopportune field for surgi-

cal attack; in fact it may be the direct cause of exacerbation of the disease which leaves the patient far worse than before surgical treatment was undertaken. Although it has been argued that it is desirable to remove a completely destroyed kidney in order to improve the general health of the patient and so enable him to overcome the infection of the opposite kidney, this practice should be condemned and such cases treated on conservative lines, preferably with sanatorium care. The few cases of bilateral disease in which operation was undertaken and cure reported were in all probability mistaken diagnoses, and what appeared to be a bilateral lesion was in reality contamination of the healthy ureter by back-wash or ureteral reflux from the infected bladder, due to tuberculous involvement and subsequent incompetency of the uretero-vesical valve, a condition which is not infrequently encountered.

Although it is true that an experimental animal will survive with little more than one-half of one healthy kidney, the too enthusiastic extirpation of vital organs such as the kidney is a practice which must be condemned, and particularly so in renal tuberculosis in which the destiny of bacterial implantation seems to point to bilaterality, and in which the outcome is uncertain, unless it can be demonstrated beyond doubt and on repeated occasions that the lesion in the renal tissue is progressively destructive and that the other kidney is healthy, in which case it constitutes a serious impediment to the body economy and demands surgical extirpation. I share the opinion of the more conservative group that surgery is only indicated for destructive unilateral tuberculosis, and that it is contraindicated for (a) non-destructive uni- or bilateral lesions; (b) for bilateral destructive lesions; (c) for a unilateral destructive lesion in which the other organ manifests advanced nephritic change; (d) and for a unilateral destructive lesion until a non-destructive lesion in its mate has become arrested. As a general rule nephrectomy is also contraindicated in the presence of advanced genital tuberculosis and during the activity of tuberculosis elsewhere in the body, but may be undertaken during the quiescent stage. The treatment of the patient does not end with the surgical treatment of the local focus; a sound course of general sanatorium care is required. A patient who shows

no recurrence for three years will in all probability remain well.

It is natural to enquire whether a cure can be effected by conservative methods of treatment similar to those employed for tuberculosis of other organs. Cases of spontaneous healing of advanced lesions are rare, but have been described. We must then consider whether or not this is a justifiable method of dealing with these cases. Both Rollier and Sir Henry Gauvain have expressed their dissatisfaction with heliotherapy as the sole agent for the control of renal tuberculosis. Wildbolz¹¹ reported the results obtained in 316 cases not operated upon, and of these 58 per cent had died within 5 years following observation and only 6 per cent had lived more than ten years. Persson⁷ reported that in 84 cases of renal tuberculosis, of which 23 were proved to be chronic unilateral disease, 71 persons, or 84 per cent, had died within a 5-year period.

Tuberculin has been tried with very indifferent results, but its exhibition post-operatively may hasten clinical arrest.

The past year has seen a very decided and sincere attempt to apply heliotherapy directly to the urinary tract. Caulk and Ewerhardt¹ have developed a cold quartz applicator for the purpose of ventilation and irradiation of the bladder. The adaptation of this instrument for the tuberculous bladder is based on the knowledge that radiations in the wave band between 3130 - 2250 Angström units have a very decided bactericidal effect. Lubash,⁵ of New York, has literally borne the torch of heliotherapy to the kidney itself. He has perfected an ingenious device in the form of a cold quartz applicator which may be introduced into the pelvis of the kidney by means of the ordinary ureteral catheter, without causing undue trauma to the integrity of the urinary tract, and thereby has been able to irradiate the kidney with short exposures of quartz vapour. Caulk² reported very pronounced clinical arrest of the distressing symptoms associated with tuberculous cystitis following nephrectomy of the offending organ. It is as yet premature to state what clinical results will be achieved by these innovations, but they are rather impressive of the decided trend towards conservatism in the management of early tuberculous changes.

The operation of castration for genital tuberculosis is mentioned only to be condemned as

an illogical procedure. In about 75 per cent of the cases genital involvement eventually becomes bilateral. The lesion in the scrotum may be acute in onset, in which case it may simulate an epididymitis of specific origin, and may proceed to abscess-formation, requiring aspiration or open drainage, and if need be the performance of epididymectomy during the quiescent stage. The only alternative to epididymectomy and conservative hygienic treatment for genital tuberculosis is the performance of radical excision of the seminal tract according to Young's technique, including removal *en masse* of the prostate, seminal vesicles, vasa and epididymes, but this is a procedure which should only be undertaken by those qualified by training and experience in the conduct of perineal surgery, otherwise it may be followed by very indifferent and in some cases disastrous sequelæ as a result of extension of the process or operative trauma to the rectum, and the subsequent development of rectal and vesical fistulæ, urinary incontinence, etc.

SUMMARY

1. Sufficient clinical and experimental evidence has been accumulated to warrant at least partial revision of our conception of the nature of the pathological process in and the progress of genito-urinary tuberculosis.

2. The lesions revealed in nephrectomized kidneys and at post-mortem are representative of the end-stage of the disease and are therefore not suitable material for the study of its early manifestation.

3. The tendency in renal tuberculosis is towards bilateral implantation of the tubercle bacilli in approximately 60 per cent of cases.

4. Every patient with pulmonary tuberculosis is a potential candidate for urinary tuberculosis, and in fact may harbour lesions, despite the absence of symptoms referable to the urinary tract.

5. Continued progress in the early recognition and control of genito-urinary tuberculosis demands greater diagnostic efficiency.

6. Non-destructive uni- or bi-lateral renal tuberculosis is not a surgical condition and calls for conservative treatment.

7. Repeated urological studies are required before designating an early lesion as progressively destructive; nephrectomy is seldom an emergency procedure.

8. Early inflammatory renal lesions may heal spontaneously, and it is not unlikely that many cases of renal tuberculosis are overlooked on this account.

9. Surgical treatment is a means to an end and should be regarded only as an aid in securing clinical arrest of the disease. It should invariably be supplemented by constitutional care both before and after operation.

10. The patient's resistance, both general and local, should be mobilized before surgical intervention is undertaken.

11. The application of heliotherapy directly to the urinary tract may offer a means of hastening the resolution of inflammatory or non-destructive renal lesions.

12. Unilateral progressively destructive renal lesions demand surgical extirpation; bilateral destructive lesions should be treated along conservative lines.

13. Intravenous excretion urography, properly interpreted, may in the near future prove the most valuable means of detecting early tuberculous renal change.

14. Genital tuberculosis is usually the result of extension from a renal lesion, the prostate and seminal vesicles being the primary foci.

Castration should never be performed; epididymectomy may be indicated for a destructive lesion in the serotum.

15. It is impossible to extirpate all of a given patient's tuberculosis, and therefore constitutional hygienic treatment forms an integral part of therapy, regardless of whether or not surgery is contemplated.

The author wishes to acknowledge the cooperation of the Winthrop Chemical Co. of Canada whose assistance made intravenous urographic studies in this series of cases possible.

REFERENCES

1. CAULK, J. R. AND EWEHARDT, F. H.: Transurethral application of ultra-violet radiation and ventilation of interior of bladder for relief of tuberculosis and other infections of this organ, *J. Urol.*, 1932, 28: 503.
2. CAULK, J. R.: Personal communication.
3. HARRIS, R. I.: Tuberculous bacilluria; its incidence and significance amongst patients suffering from surgical tuberculosis, *Brit. J. Surg.*, 1929, 16: 464.
4. HELMHOLTZ, H. F.: Kidney, filter for bacteria, presence of bacteria in blood, kidney and urine after varying intervals following bacterial injection, *Am. J. Dis. Child.*, 1925, 29: 497.
5. LUBASH, S.: Direct internal ultra-violet radiation to the entire genito-urinary system, *J. Urol.*, 1933, 30: 231.
6. MEDLAR, E. M.: Cases of renal infection in pulmonary tuberculosis; evidence of healed tuberculous lesions, *Am. J. Path.*, 1926, 2: 401.
7. PERSSON, M.: Renal tuberculosis; clinical survey of 295 cases, 90 of which were not operated on, *Ann. Surg.*, 1925, 82: 526.
8. THOMAS, G. J.: Renal tuberculosis, *J. Am. M. Ass.*, 1930, 95: 229.
9. VOLHARD, F. AND FAHR, T.: Die Brightsche Nierenkrankheit, Springer, Berlin, 1914.
10. WALKER, K. M.: Diseases of male organs of generation, Oxford Univ. Press, London, 1923, p. 76.
11. WILDBOLZ, H.: Renal tuberculosis, *J. Urol.*, 1929, 21: 145.

CYCLOPROPANE ANÆSTHESIA: A CLINICAL RECORD OF 350 ADMINISTRATIONS*

By HAROLD R. GRIFFITH, M.D.,

Montreal

IN 1929 Lucas and Henderson, of the University of Toronto, published in this *Journal* the first report¹ on cyclopropane gas ($\text{CH}_2\text{CH}_2\text{CH}_2$) as an anæsthetic agent. Their work was confined to animal experimentation, but their results pointed to the possibility of the advantageous use of the gas for surgical general anæsthesia. They showed that it could be given with a high percentage of oxygen, that it produced good muscular relaxation, and that it did not upset metabolism or show evidence of toxicity to any of the organs.^{2,3} The difficulties of manufacture of the gas in quantity sufficient for human use were such that it was not until

1930 that the Ohio Chemical & Manufacturing Company produced a few gallons in a very pure form. In December, 1930, R. M. Waters, of the University of Wisconsin, administered it to the first human cases. Since then he has been the leader in clinical experimentation with this gas. During the summer of 1933 Stiles, Neff, and Rovenstine, working under the direction of Professor Waters, carried out a series of over six hundred administrations to patients in the State of Wisconsin General Hospital, Madison, Wisconsin. Their report has recently been published.⁴ They have confirmed the findings of Lucas and Henderson in regard to the safety of the gas, and found that it produced quiet, relaxing anæsthesia in human patients. Their work with the gas is continuing.

* From the Department of Anæsthesia, Homoeopathic Hospital of Montreal. Read before the Montreal Society of Anæsthetists, on June 6, 1934.

My own interest began in October, 1933, when on a visit to Madison I was greatly impressed with the type of anæsthesia I observed. The first cyclopropane used in Montreal was on October 30, 1933, and since that time in our hospital we have used this gas in preference to other agents for general anæsthesia. We have purposely tried it out in as wide a variety of operations as possible, and the present series comprises a record of our experiences in the first 350 cases. For ten years I have been an enthusiastic user of ethylene,⁵ but I think that this gas is doomed in view of the many advantages of cyclopropane. So far as our present experience goes the latter seems to be a safe, controllable, non-irritating, non-toxic anæsthetic agent, permitting good oxygenation, pleasant to take, and providing satisfactory relaxation.

Our patients have been of all ages, from sixteen months to seventy-eight years, strong and weak, fat and thin, good risks and very poor ones. In this series 288 of the patients were private cases and 62 public. The operations were performed by 54 different surgeons.

Abdominal surgery.—Two hundred and six of the operations have been abdominal sections, classified as follows: appendicectomy, 99; gall-bladder and stomach operations, 17; herniotomy, 17; hysterectomy, 27; Cæsarean section, 13; other abdominal operations, 33.

We have found cyclopropane very satisfactory for abdominal surgery, giving relaxation in almost every case. We have had to add ether in less than 5 per cent of the cases. In some cases where the patient is under light anæsthesia the muscles are not completely relaxed, but breathing remains quiet, and there is no straining and pushing out of the bowel as one so often sees in other forms of gas anæsthesia. I think the best proof of the satisfactory nature of the anæsthesia produced is that there has been no complaint from fifty-four different surgeons.

Cyclopropane will even give relaxation of the sphincter ani for hæmorrhoidectomy in cases where we do not wish to use spinal anæsthesia. We have used it in 23 cases for the reduction of fractures. Here it allows easy manipulation of the limbs, and we have been able to secure good relaxation in even the strongest workmen without pre-operative preparation.

Use in obstetrics.—We have been particularly pleased with the results of cyclopropane in 37

obstetrical cases—13 Cæsarean sections and 24 forceps delivery and repair. We have not used it for analgesia in the first or second stage because of the cost of administration, and here nitrous oxide-oxygen is satisfactory, but where continuous anæsthesia and relaxation are required the obstetricians are enthusiastically in favour of cyclopropane. In our cases there has been remarkably little post-partum bleeding, and there is a quiet dry field for repair. The subsequent condition of the patients has been excellent, with none of the shock one often sees after the use of chloroform or ether. The Cæsarean patients have all made uneventful and rapid recoveries.

The method of administration.—Lucas and Henderson, and, later, Waters and his associates found that cyclopropane produced surgical anæsthesia in a concentration of 10 to 15 per cent in oxygen. These are such radically different proportions from what we are accustomed to using in nitrous oxide or ethylene that we have to change our technique of administration. My conception of anæsthesia with the older gases is that we administer the gas, plus enough oxygen to keep the patient alive and in good condition. With cyclopropane, on the other hand, we administer oxygen with just enough of the anæsthetic gas to keep the patient asleep. It is a very potent gas, and I like to feel that I am administering it as cautiously to my patient as I would chloroform—figuratively speaking, “a drop at a time”, although in this case the measure is in cubic centimetres and not drops. So far the cost of cyclopropane has been high, and this has helped to make us cautious with its use. After much experimentation, Mr. C. H. Wardell, chief chemist of the Ohio Chemical & Manufacturing Company was able to produce a gas free from the impurities which had hindered Lucas and Henderson, and safe for human use. The first gas was produced at a cost of \$2.00 a gallon. At present the price has been reduced to fifty cents a gallon, and it is likely that it will soon be much cheaper. However, even at fifty cents a gallon, by using “closed circuit” anæsthesia, with carbon dioxide filtration technique, we have been able to make the use of cyclopropane economically feasible—a little goes a long way. In our series of 350 cases we have used a total of six hundred and twenty-five gallons of cyclopropane, an average of 1.79 gallons per case. One operation lasted

for four hours with a consumption of less than three gallons of the gas. We have used the Foregger "Metric" gas machine, with fine flow meter for both oxygen and cyclopropane, and with either the "circle" filter, or Waters' "to-and-fro" filter for carbon dioxide absorption. In 49 operations on the head, chest, and upper abdomen, and in very fat patients, we have administered the cyclopropane through an endotracheal tube, using a Guedel-Waters inflatable balloon around the tube in the trachea to maintain a completely closed circuit. The introduction of the endotracheal tube is somewhat easier under cyclopropane than with ethylene or nitrous oxide.

We have made no analysis of samples from the breathing bag, but from the amount of gas used we presume our anæsthetic proportion is about 10 to 15 per cent, with the remainder oxygen and some atmospheric nitrogen. As with other anæsthetic agents, patients vary greatly in their susceptibility, but we have not met any who could not be put to sleep. In the low concentration used cyclopropane has a pleasant odour, is not at all irritating, and induces unconsciousness about as rapidly as nitrous oxide or ethylene. I have put myself to sleep with it several times, and found it very pleasant. The quietness of induction and quiet breathing remind me of chloroform anæsthesia. Indeed, the signs of anæsthesia are about the same as with chloroform, except that, even when deeply anæsthetized, the patient is always a good colour on account of the excess of oxygen. The skin remains warm and dry. It goes without saying that an unobstructed airway is just as important with cyclopropane as with every other anæsthetic. There has been no increased secretion of mucus in our cases. Animal experimentation has shown that when cyclopropane is given in very high concentration there will be failure of respiration and asphyxia before any marked change in the cardiac function. We have not attempted to demonstrate this in any of our cases, and we have had no accident. I have noted, in a few cases, a transitory irregularity of the pulse when I was attempting quickly to deepen the anæsthesia. This has always passed off as soon as more oxygen was added. We must await further electrocardiographic studies before the effect on the heart is fully understood.

Pre-operative medication.—We have found that a small rectal dose of avertin (tribromethyl

alcohol) makes an effective combination with cyclopropane for major surgery, and it has been given to 103 of our patients in this series, usually in a dose of 80 mg. per kilogram of body weight. Patients like the quiet easy induction of sleep in their own beds, and the awakening is gradual and pleasant. With the small dose of avertin used we do not see any depressing effects from this drug. For nervous children, especially, avertin induction is a blessing. Most of the other patients have been given one and one-half or three grains of nembutal (pentobarbital sodium), with or without a sixth of a grain of morphine an hour before operation. We feel that a patient is entitled to the benefit of any harmless drug which will make the ordeal of surgery less terrifying.

Post-operative complications.—Nausea and vomiting have occurred in about the same proportions of cases as after other gas anæsthetics. It is usually transitory, and never severe. The very thought of an operation is enough to make some people vomit. The patients who have had avertin have been singularly free from gastrointestinal disturbance.

There has been no case of post-operative pneumonia in this series. Two patients developed pulmonary atelectasis—one after operation for a gangrenous appendix and the other after thyroidectomy. In both cases the complication developed on the seventh day after operation and we did not feel that it could be ascribed to the anæsthetic. Both patients made a good recovery after carbon dioxide-oxygen inhalations. During the period under review there was one case in the hospital of typical massive collapse of the lung coming on a few hours after operation for a simple appendicectomy. I was glad that in this case I had happened to use an ordinary ethylene-ether anæsthesia, as we might have been inclined to ascribe the complication to the "new-fangled anæsthetic", if I had given cyclopropane.

Three of our patients died a few days after operation and went to autopsy. In each case death was due to peritonitis following severe pre-operative infection. The pathologist reported that he could find no change in the organs which might be attributed to the anæsthetic.

On the whole, we have been singularly free from trouble, both during and after operation, and it is our impression that cyclopropane when handled carefully is a safe, convenient anæ-

thetic agent which can be used for all types of surgery. It is inflammable and explosive in certain proportions, but the Madison workers have shown that its range of explosibility is much less than that of ethylene or of the nitrous-oxide-oxygen-ether mixture which is so commonly used. When administered by the closed circuit method the danger of explosion with ordinary precautions is negligible.

Patients under cyclopropane, as with other gas anaesthetics, seem, at times, to bleed more profusely than patients under ether. This is a superficial bleeding, due, I believe, to some effect on the vasomotor control of the arterioles. It is not caused by any chemical change in the blood or alteration in coagulability. A study of the relation between anaesthesia and haemorrhage involves the consideration of many factors, and

no one has yet settled the problem in a scientific way.

Much work remains to be done with regard to the pharmacological properties of this new gas, and our final judgment as to its value must await the verdict of the laboratory workers. The present clinical report is offered merely to show the possibility of the widespread application of cyclopropane in the operating room.

REFERENCES

1. LUCAS, G. H. W. AND HENDERSON, V. E.: New anaesthetic gas; cyclopropane, *Canad. M. Ass. J.*, 1929, 21: 173.
2. HENDERSON, V. E. AND LUCAS, G. H. W.: Cyclopropane, a new anaesthetic, *Anaesth. & Analg.*, 1930, 9: 1.
3. HENDERSON, V. E. AND LUCAS, G. H. W.: Effect of cyclopropane on metabolism, *Arch. Internat. de Pharmacodyn. et de Therap.*, 1930, 37: 155.
4. STILES, J. A., NEFF, W. B., ROVENSTINE, E. A. AND WATERS, R. M.: Cyclopropane as an anaesthetic agent: preliminary clinical report, *Anaesth. & Analg.*, 1934, 13: 56.
5. GRIFFITH, H. R.: Recent advances in anaesthesia, *Canad. M. Ass. J.*, 1933, 29: 634.

TUBERCULOSIS AN INSIDIOUS DISEASE

(ANALYSIS OF 100 CONSECUTIVE CASE HISTORIES OF MEN 35 YEARS OF AGE OR OVER).

BY D. A. STEWART, M.D., LL.D. AND E. L. ROSS, M.D.,

Manitoba Sanatorium,

Ninette

FROM earliest ages to our own time, from Hippocrates to Osler, one word has been used more often, perhaps, than any other to describe pulmonary tuberculosis. It has been called an *insidious* disease. "Insidious" means, literally, in-sitting. The picture is of a hunter in a hide, or an enemy concealed, waiting for prey or victim, with arrow ready on string. It means "full of plots", "watching for an opportunity to ensnare", or "characterized by treachery or deceit", and an insidious disease is described as "a disease existing without marked symptoms, but ready to become active upon slight occasion,—a disease not appearing as bad as it really is." In the light of today's knowledge is the old word still applicable? How long does tuberculosis wait concealed, with arrow on bowstring, ready to strike?

We should know, if we can, not only what disease is now present but how and when it began, and why. Ever since the Great War returned men have been breaking down, and having tuberculosis discovered, often very definitely old disease, but diagnosed now for the first time. It is of practical importance to know, if it can be

known, or at any rate to have a fair presumption, just how and when and why this disease of theirs actually began. It is very natural that in the mind of the sick man the most outstanding, upsetting, exhausting period of his whole life, his time of overseas service, should seem to be the time of lowered resistance that gave the disease its start. And naturally those who stand on guard over the state exchequer cannot too easily consider as war-caused a disease that did not obtrude itself by any very marked symptoms, and so did not reach diagnosis, until years after war service had ended.

How can duration be determined? By evidence such as would satisfy a court of law, say the guardians of the treasury. But tuberculosis is an insidious disease; it cometh not with observation. A definite incident which would convince a court of law would certainly have alarmed the man himself and sent him to the doctor. But it is just because there was no compelling incident that he did not go to the doctor until his disease had become advanced. We who deal with tuberculosis know that this is the rule, not the exception. But it never

ceases to be hard to "put over" to laymen, with whom decisions rest, or even to doctors who have never worked day by day with this disease, what to us are the postulates and axioms and commonplaces of every day experience—the variability of tuberculousis, sometimes rapid, sometimes life-long; its insidiousness, hidden through many years, then suddenly active and dangerous; its chronicity, spells of inactivity alternating with activity for half a life-time.

It occurred to us in this connection to make a study of 100 patients who had never had military service, and, in order that these might correspond as nearly as possible to ex-service men, we included men only from thirty-five years of age upward. To avoid unconscious choice we took such admissions consecutively. The zero hour from which we date each study is the time of admission for treatment, which usually is just after the first definite diagnosis. This is about the time also at which an ex-service man, with the point of view of present disease, thinks back across his past, and states his case to the Department of Pensions.

In this study of 100 middle-aged patients we found no new truths about tuberculosis, but old truths hammered in by striking percentages are worth repeating, and help to make more clear, even to ourselves, the chronicity, the variability, and the insidiousness of tuberculousis.

The first striking fact is the large proportion of the hundred who came to diagnosis and treatment with advanced lesions. The disease was far advanced, with marked symptoms, in 51, or 51 per cent; far advanced with less marked symptoms in 36; and moderately advanced in 10. So much for 97. In one of the three remaining it was minimal, and in two, military. And the term "advanced" is properly used. In practically all the 87 who were classed as far-advanced, there were lung cavities.

These were not average sanatorium patients. Younger people can be as bad or worse, but they average much better. These were men of 35 years and over, averaging 45, and the oldest 73. And this is definitely the kind of tuberculosis found in men at that time of life, when it is not fortunately found by routine examinations but left to find itself and ask for treatment. And this disease is as serious as it looks, for one-third of these men have since died, not quite one-third are known to be at work, and nearly one-third are still on treatment.

So tuberculousis is still well called an "insidious" disease. In some ways it is even more insidious than ever, because the higher our resistance to it becomes, the farther the disease burrows before symptoms capture the attention of the ordinary man, or at any rate before they impress him enough to bring him to the doctor. A diagnosis delayed until symptoms are complained of, in mid-life at any rate, is almost always a diagnosis made late. The modern plan is to hunt for the disease *before* it is complained of, by a routine examination, including x-ray film, not after a man has become ill but while he is still apparently well. Better than any other scout the x-ray can find the hunter in his hide, or the enemy in his concealment, *before* the fateful arrow has been shot.

It is manifestly useless to propose at this time that examinations including x-ray films shall be made of all people as a routine measure. But it is not too much to insist that such examinations shall be made freely and readily when there has been any known contact with tuberculousis, when symptoms are in the least suspicious, in debility, or in undiagnosed illness, especially chronic, in diabetics and bronchitics and asthmatics, and before anæsthetics. The one time to find insidious disease is while it is still hidden, and the arrow still on the string. When the arrow has sped the disease is open to all men.

At the time of diagnosis most of the hundred men thought their disease comparatively new. But enquiries over the past years brought out earlier symptoms and sequences of events. For anything like good health some had to look back several years. But the onset had been so gradual, and with such small incidents, that they had scarcely noticed it. So far as we could estimate the duration of disease, the interval from the earliest manifestation or suggestion recognizable in the light of after events to the breakdown that led to diagnosis and admission to the Sanatorium, varied from a month or two to more than twenty years, and *averaged 9.5 months, or over 8 years*. From first symptom or incident now recognizable to diagnosis the duration seemed as follows.

One year or less in.....	17
One to two years in.....	10
Two to three years in.....	9
Three to five years in.....	14
Five to ten years in.....	17
Ten to twenty years in.....	26
Over twenty years in.....	7

Half the number had a presumed or known duration of five years or less, two-thirds ten years or less, and one-third over ten years. More than half had a duration of from five to twenty years, and 7 per cent, a presumed or known duration of over twenty years.

The time of onset of tuberculosis can be exactly known perhaps only in infants, or jungle natives, exposed to one definite infection. In civilized life, and for adults, the infection and disease come out of a maze of conditions and events. But looking back from the top of the hill, the way we have come may be followed more clearly. Hindsight is wiser than foresight.

In the hundred middle-aged people under discussion there were a few earlier incidents and symptoms that could be fairly definitely associated with tuberculosis, such as hæmorrhage in 8 cases, pleurisy with effusion in 6, and pleurisy pains in 13. These are the most definite. But the truth is that even these most definite indications are not absolutely diagnostic. Pains that might be rightly or wrongly considered pleuritic, pleurisy with effusion, and even hæmoptysis, though very likely evidences of tuberculosis, may all have had other causes.

Suspected incidents or symptoms, even less exclusively associated with tuberculosis, found in this hundred cases were, cough and expectoration in 23, cough in 13, frequent colds in 12, influenza in 5, tiredness and weakness in 5, pneumonia in 4, bronchitis in 3, and "asthma", so-called, in one. None of these are pathognomonic of tuberculosis. They all occur in other diseases as well as in tuberculosis. Cough and expectoration, and bronchitis, for instance, belong even more markedly to certain other types of disease than to tuberculosis. But when these incidents or symptoms recur from time to time, or are followed up by other similar sequences, and especially when they lead up to a discovery of advanced tuberculosis, they create a presumption for a date of beginning which approximates proof. In 55 out of the hundred cases studied there had been a fairly constant sequence of what, looking back upon them, were significant symptoms or events, though often not definite enough to attract attention at the time. In 45, or nearly half, no such sequences could be made out, following the first isolated symptoms or events. In 30 of these there had been "good health" in the interval, in 10 "fairly

good health" and in 5 good health except for "frequent colds."

Strictly speaking, there is only one absolute proof of tuberculosis, and that is the finding of tubercle bacilli. And there is only one absolute proof of murder, the catching of the murderer in the very act. A man walking along a busy street may arouse no suspicion, even if the body of a murdered man has just been found there. But if he passes again and again, apparently without purpose, if he haunts the place, suspicion should fasten upon him. The history and progress of tuberculosis up to the time of definite diagnosis cannot be a matter of absolute proof, but is mostly a matter of circumstantial evidence based on significant incidents and sequences that lead up to known, observable, measurable and provable disease.

In considering how and when tuberculosis began, undoubtedly consideration must be given to periods of excessive physical exertion, exposure to the elements, unsuitable and bad environment, poor food, insufficient rest, exposure to acute infections, nervous tension and worry. Any such conditions in the history of a civilian would be considered as of great significance, for instance, a night of exposure in the woods while hunting, a very unsanitary and uncomfortable home, a period of family worry, or bad hours and conditions of work. When almost all adverse conditions imaginable are combined in a period of military service it cannot be considered as of little or no significance, even if the patient is a man his country called forth to serve in war abroad.

In arriving at the age of a horse there are several points to consider, but an expert horseman, whatever else he may do, will never fail to look at the teeth. There are many points about a tuberculous man and his history which help us to determine how long the disease has been present, but whatever else we may do we must never fail to look at the x-ray films. Films do not carry cryptic signs that can be translated into exact dates, but tuberculous disease does leave its marks of age, somewhat as world upheavals have left their records in the rocks; diseased tissues become fibrous, thick and tough; they cavitate; or stony deposits of calcium accumulate; and all these changes cast shadows that are distinctive in extent, arrangement and density. In the x-ray films of the hundred cases studied, evidence of chronicity, as shown by

fibrosis and calcification, were marked in 15, moderate in 56, slight in 22 and absent in 7. It is true that processes which leave x-ray shadows may be more rapid in some than in others, yet when all that is known of the present disease is studied, the scattering bits of history, the resistance or lack of resistance, the physical signs, and the x-ray films, and especially when these can be compared over a considerable time, the duration of disease can be judged quite closely enough for any ordinary purpose.

The onset of present disease as the patient knew it, the increase of illness or the debility that at last brought him for diagnosis and treatment, are, of course, very different from the actual beginning of things. The present exacerbation began gradually and insidiously in 72 of the 100 cases and rather acutely in the remaining 28. Among the acute beginnings of the present exacerbation were hæmorrhages in 5 and pleurisy with effusion in 2.

Why was disease so far advanced in most of these cases before treatment was begun? The answer once more is that the disease is insidious. Before it showed plainly it had become advanced. A careful routine examination, with x-ray film, would have found disease in some of these men twenty years earlier than it was complained of. In our race and in our time symptoms are not to be depended on for discovering tuberculosis early, or even late, or even very late. The disease can make its changes so very quietly, with such slight symptoms, and such slow burrowing and sapping that the body may be like a doomed tree, rotten at the core, and destined to fall in the next gale, but still with little outward sign of any inner rottenness except to the experienced eye of the forester.

After spending half a life-time in reconstructing the tuberculosis life-histories of thousands of ordinary people from significant incidents, chains of events, family and contact and personal histories, general physical make-up, known present conditions, known present reactions, known present progress toward better or worse, and from the almost geological strata of x-ray films, and having had corroborations in thousands of cases by after events, we have no difficulty in having such reconstructions accepted as essentially correct by experienced groups of physicians, and no objection raised to making these the bases for varying treatment and prognosis. But it is difficult to get such presump-

tions accepted, or the way they are arrived at appreciated, by the assessors in tribunals, lay or medical, who have little or no experience of the ways of tuberculosis, except the slants and smatterings their work has given them. In a tribunal not long since the problem was one of a man who, after considerable service with the Canadian forces, had a period of service with the Imperial Air Force. Tuberculosis, with bacilli, shortly after the war, was undoubted, and in a general way attributability to some part of war service pretty well conceded. The question was, which service caused the tuberculosis? The contention of the Canadian Department naturally was that the later Imperial service, the one nearer to the time of disease discovery, was responsible. An opinion was presented to the court that it was more likely to have been the first, or Canadian, service that was responsible. It was pointed out that the Canadian service was nearly twice as long as the Imperial; that it was service as a private, in France, in the trenches or as dispatch rider and ambulance driver, that it included the whole of "the Somme", many "colds", a break down in health and change of duty as a result. The Imperial service, on the contrary, was with the flying corps, was about half the length of the Canadian service, was service wholly as an officer, in good quarters, and wholly in England, was entirely spent in training or teaching, and with no actual war duty. It was about one-third post-armistice and included three or four months' leave of absence. It had just one drawback—a head injury while in training. Loss of blood, at the time of the injury only, the court seemed, wrongly, to think had extended over a considerable period, and gave this undue weight.

It is difficult to see how any one experienced in the ways of tuberculosis could hesitate for a moment between the hard and long Canadian service and the unusually easy and short Imperial service, in looking for the beginnings of tuberculosis. Yet the learned presiding officer of the court was pleased to characterize such an opinion in writing as "mere guess and speculation," and consider the case settled adversely for the man unless "factual" evidence could be brought. Weight was given also to a hurried routine examination (in war-time fashion, with stethoscope only and no x-ray films) on entering the Imperial service in which tuberculosis had not been found—so, presum-

ably, could not be there. In the case referred to it may be added that new evidence records pleuritic pains during Canadian service, and rest, then change of duty, ordered on account of it. Yet the decision has not yet been reversed.

It was with the idea of showing how little there is that is "factual" or provable by court standards in one hundred cases of advanced tuberculosis that this series was studied, and at the same time to show how broadly based and essentially correct presumptions of duration can be. A way of careful reconstructions of tuberculosis histories, considered reliable bases for treatment and prognosis in 100 people of no military service, of comparable age and sex, should be reliable enough also for the hundred and first who happens to have had military service. In all such cases court of law type of proof is scarcely ever available, but careful and unprejudiced gathering and examination of data, and interpretation in the light of experience and with fair judgment should reach essentially right conclusions.

SUMMARY

1. Of 100 men of 35 years or over, averaging 45 years, at the beginning of treatment for tuberculosis, 87 had far advanced disease, 10 moderately advanced, 1 minimal, and 2 military.

2. Such advanced disease is not unusual at the ages of this group, but usual.

3. The duration of disease from a presumed early incident to the time of diagnosis and the beginning of treatment averaged over 8 years.

4. During that period there was a suggestive sequence of suspicious incidents in 55 and incidents, but no sequences, during the whole time, in 45.

5. The exacerbation that led to diagnosis and treatment was slow and insidious in onset in 72 and more acute in 28.

6. In all cases there were incidents suggestive of tuberculosis, but in no case until diagnosis, could these, looked at in retrospect, be considered absolute proof of tuberculosis.

7. Fibrosis and calcification were marked in 15, moderate in 56, slight in 22 and absent in 7.

GENERAL PRINCIPLES

1. Only in extremely rare cases, such as in infants having a single known exposure, can the date of onset of tuberculosis be exactly established.

2. The establishment of the date of onset in retrospect must be a matter of intelligent judgment based on known facts, interpreted by considerable experience.

3. There is one only absolute proof of tuberculosis, the finding of tubercle bacilli.

4. Tuberculosis, especially in those of middle-age, is almost always far advanced when it is allowed to declare itself by symptoms.

5. The earlier stages of tuberculosis, which may occupy many years, have usually significant signs, often slight, but none pathognomonic.

6. Tuberculosis is an insidious disease, even more insidious in our race and time than in olden times and in other races, because of our fair resistance.

7. The only way of dealing with the insidiousness of tuberculosis is to make careful examinations, including x-ray, either at intervals as a routine or on many indications that seem slight and unimportant.

SEMEN APPRAISAL: A DIFFERENTIAL STAIN THAT ADVANCES THE STUDY OF CELL MORPHOLOGY.—William H. Cary and Robert S. Hotchkiss endeavour to simplify and clarify the essential features of semen examination with special regard to defective spermatogenesis in otherwise healthy men. A new method of fixing and staining a microscopic specimen is detailed, which differentiates component parts of the cell without distorting the protoplasm and enables any physician familiar with the use of the oil-immersion lens to recognize and classify abnormal sperm cells, and, in specimens of doubtful character, to count the percentage of these cells as an added index of deficiency or improvement. Such a contribution seems indicated, for, while the profession and also the public now recognize the potential responsibility assumed by the husband in an involuntarily childless marriage, there is convincing evidence that the more thorough study necessary for properly appraising

male reproductive vigor is still unappreciated or not believed and thus incorrect diagnoses are frequent and much useless gynecological surgery continues. Not only are urological and endocrinological reviews relative to male fertility commonly neglected, but the examination of the semen, the chief clinical evidence of fecundity, receives but the most elemental consideration. The authors do not aim to define an illusory point at which a male specimen may be said to be fertilizing or non-fertilizing, but strive to give the practical evidence by which semen deficiency may be estimated, errors in diagnosis reduced, and the necessity for improving the husband as an important factor in the treatment of involuntary sterility recognized. The importance of semen subnormality as an element in the sterile union may not be determined by this evidence alone but by the facts elicited in a complementary study of all factors affecting fertility in the husband and wife.—*J. Am. M. Ass.*, 1934, 102: 587.

THE EARLY DIAGNOSIS OF CANCER IN THE BLADDER, PROSTATE AND KIDNEY*

BY JAMES C. McCLELLAND, F.R.C.S.(C.),

Toronto

XII.

ANY variation from the normal function of micturition may mean cancer† in the urinary tract or adjoining organs. We are accustomed to look upon hæmaturia as the index which leads us to examine for cancer, but other disturbances of micturition, such as frequency or pain on urination, are often caused by cancer in the urinary tract, and frequently are present before hæmaturia. This should lead one to investigate all cases of frequency, pain, hæmaturia, urgency and retention, to determine the cause. Inflammations, tuberculosis, calculus, strictures, etc., must be kept in mind at the time of the examination, as well as the possibility of the presence of a malignant tumour in some part of the urinary tract.

CANCER OF THE BLADDER

Cancer of the bladder at some time in its course causes hæmaturia. In a small series of 65 personal cases blood was seen at varying times during the disease in 95 per cent. This is the outstanding sign of a neoplasm in the bladder, and it may occur as a simple hæmaturia or be associated with frequency, dysuria, or even retention. If frequency is present there are pus cells in the urine, indicating that an inflammatory process is in progress. The onset of a cystitis means that the tumour has been present some time and most likely has begun to infiltrate the bladder wall, when it is no longer an early tumour growth. Frequency occurred in 64 per cent of this series.

Hæmaturia may occur during one urination only, but usually is present for a day or two. Another attack may not come on for a full year, but eventually it returns and remains a few days again. Following this, the interval between

attacks lessens, while the tumour is growing and the chance of cure diminishes. In questioning these patients one finds that they have been given some medicine "that stopped the bleeding" but no investigation of the cause of the bleeding was carried out. It is our duty as physicians and surgeons to examine these patients thoroughly at the *first* bleeding and not postpone it until several attacks have occurred. There are many other causes of hæmaturia than tumours in the urinary tract, but one should consider the *first* attack as due to cancer until it is proven to be otherwise. It happens occasionally that no cause for the bleeding is found, but one has the satisfaction of knowing that the patient has been thoroughly examined and the usual causes of hæmaturia ruled out.

Pain is not an outstanding symptom. It was present in 16 per cent of cases. It is the usual pain of a cystitis, namely, pain in the urethra during and after urination, and occasionally a dull ache in the lower abdomen. Pain in the kidney area is present frequently with a small papillary growth at or near the ureteral orifice of that side. Two patients were seen who came complaining of pain in the kidney area without hæmaturia and a small growth was found near the ureteral orifice on the side of the pain.

In 8 per cent *frequency* was present and no hæmaturia. In this group one has to be on guard and investigate the cause of the change in the function of the bladder. In other words, the absence of hæmaturia may give the physician a false sense of security, leading him to rule out the cancer and treat his patient for an inflammatory lesion, when the real cause is a growth in the bladder.

The duration of symptoms in my series varied from one to nine years. The length of time the symptoms have been present is no indication of the size or curability of the tumour. The patient with the nine-year history had a small papillary carcinoma on a pedicle, the size of a small cherry, which was destroyed by one treatment through the cystoscope. Another patient.

* Earlier articles in the series on the early diagnosis of cancer can be found in the *Journal* as follows:—1933, 29: 465; 1934, 30: 46, 48, 50, 168, 171, 280, 283, 522, 639; 31: 9.

† For the purposes of this paper the term cancer is used loosely to mean any malignant tumour or any potentially malignant tumour.

investigated two weeks following his first attack of hæmaturia, had a tumour the size of a large grape-fruit which was beyond hope of cure. This man had had frequency for four years which was not investigated or he might have been helped.

The following brief histories will illustrate the above statements.

CASE 1

A male, aged 26, had one attack of symptomless hæmaturia one month before consultation, lasting one day. This was followed by a dull aching pain in the right flank. The urine was examined several times, but no pus or blood was found. Plain x-ray was negative for stone. Cystoscopy showed a small papilloma at the right ureteral orifice. This was destroyed by one electro-coagulation through the cystoscope.

CASE 2

A female, aged 33, had blood intimately mixed in the urine for four months, but no frequency. Cystoscopy showed a small papilloma on the trigone which was destroyed through the cystoscope by one treatment.

CASE 3

A male, aged 67, had blood at the end of urination two months before examination, and again during the week immediately before he was seen. There was slight frequency and the urine contained some blood and pus. Cystoscopy showed a growth the size of a walnut with a roughened surface and on a pedicle. This was a malignant papilloma, and was removed completely by electro-coagulation by suprapubic cystotomy. He has been followed for two and a half years and no recurrence has appeared.

Comment.—These three histories show how examination soon after the onset of symptoms results in giving these patients a much better chance of cure.

CASE 4

A male, aged 62, had blood in the urine three years before he was seen. This had been coming almost continuously for four months, accompanied by the passage of clots and a good deal of frequency. Cystoscopy showed an infiltrating carcinoma in the left base of the bladder which could be felt above the prostate on rectal examination. Diagnosis—Inoperable carcinoma of the bladder.

Comment.—This patient should have presented himself for an early examination at the first onset of frequency.

CASE 5

A male, aged 72, had difficulty in voiding for three years and a good deal of frequency. The last few weeks he had had some hæmaturia. Examination revealed a tumour in the bladder, which could be felt on rectal examination, infiltrating the posterior bladder wall. Edema was present in both thighs and there were secondaries in the inguinal glands.

Comment.—The frequency should have been investigated much sooner. Some of these patients will endure a great deal of discomfort before consulting their family physicians.

From the above one concludes that any varia-

tion from the normal function of micturition should be investigated, to determine if early pathological conditions may be present which can be completely removed. Bladder tumours, found early, can be destroyed through the cystoscope; others can be removed by operation; but the late infiltrating tumours have a very high mortality.

Diagnosis.—The early diagnosis of bladder tumours must be made by cystoscopy. They are present usually in the neighbourhood of the ureteral orifices, occasionally at the internal vesical orifice, and, rarely, at the apex of the bladder. A careful study of the tumour with the cystoscope will determine the best form of treatment to carry out.

CARCINOMA OF THE PROSTATE

Carcinoma of the prostate occurs most frequently between the ages of 60 and 75 years, though, rarely, it may occur as early as 40. The symptoms are *frequency, difficulty, pain on urination and retention*. These occur with relative frequency, but cannot be called early signs. They are late signs and, unfortunately, they are the only signs we have. Usually, when a patient with this condition consults his physician, complaining of one of the above symptoms, and a cancer is found in the prostate, it has progressed to a degree that any hope of curing him is passed, though he can be helped. Hæmaturia is rather an uncommon symptom in carcinoma of the prostate, and relatively is much more frequent in the benign adenomyoma. Pain low in the lumbar region is a sign of secondaries from carcinoma of the prostate. Secondary growths occur in the bones of the lower spine, and the patient may have pain over the hips, down the thighs and in the legs. It happens, rarely, that a patient comes complaining of slight frequency and slight difficulty, and examination reveals an early carcinoma in the prostate.

Diagnosis.—The diagnosis is made by rectal examination. Clinically, there are three types of carcinoma in the prostate: (1) the hard and nodular; (2) the hard and smooth; (3) the smooth and elastic.

1. *The hard and nodular type* is most common. The normal outline of the prostate is obliterated and the surface is rough. Pressure over the rough areas shows them to be stony hard, and the whole gland is fixed to the sur-

sounding tissues. Infiltration occurs upwards behind the bladder into the region of the seminal vesicles and the lower ends of the ureters. Rarely, the growth infiltrates downward around the membranous urethra.

2. *The hard and smooth* variety is difficult to diagnose. This type is about the normal size of the gland, is smooth, but stony hard on pressure, showing none of the elasticity one finds with the adenomyoma. The diagnosis must be made on the hardness. This is sometimes confused with the induration of chronic inflammation. The difference is shown by the presence of pus cells in the prostatic secretion.

3. *The smooth and elastic* type is the benign adenomyoma which contains a nodule of carcinoma. It is removed by operation, and most of the gland is found to be benign, but one small carcinomatous area is found by the pathologist. This area of malignancy may never be suspected, but is found on routine microscopic examination.

If one is fortunate enough to find a nodule of malignancy in the prostate which has not gone beyond the gland there is a good chance to cure the patient by a radical prostatectomy. This is a complete amputation of the prostate from the neck of the bladder. At this early stage the patients do not usually have any symptoms.

KIDNEY CANCERS

The early signs of cancer of the kidney are *hæmaturia* and a *mass in the flank*, occurring with the same relative frequency. Less frequent is *pain*. The *hæmaturia* may be unaccompanied by other symptoms, or in a few instances may be associated with pain in the flanks. A blood clot passing down the ureter will give a typical ureteral colic, or there may be only a dull aching pain over the kidney area. Quite often the mass in the flank is found by accident. The patient may be palpating the upper part of the abdomen and find a lump and consult his doctor regarding it. Again a physician, while making an abdominal examination, may find the lump of a kidney tumour present in the flank. The cardinal signs of a kidney tumour are three in number, namely, a *mass in the flank*, *pain* and *hæmaturia*. The duration of symptoms sometimes extends over several years. One patient seen a short time ago had her initial hæmaturia seven years before. This does not occur very often, as a malignant kidney tumour usually runs a very rapid course.

Diagnosis.—These patients should have a complete cystoscopic investigation at the first hæmaturia if they are to be given a chance of cure.

The physical examination in a suspected case of kidney tumour is often negative. If the growth has progressed sufficiently to be felt it may replace the kidney completely or be felt as a mass attached to it. The urine in these cases may contain red blood cells, very rarely, pus cells, and, frequently, casts. Cystoscopy and pyelography should be done. There may be a bloody efflux from the ureteral orifice of the suspected side, or blood be found in the ureteral specimen from that side. The pyelogram is the most important aid in our diagnosis. This will show a filling defect in the kidney pelvis where the tumour has altered the contour of the calyces or completely replaced them. The following brief histories will illustrate typical tumours.

CASE 6

A male, aged 32, had a symptomless hæmaturia for one year and an uncomfortable feeling in his left flank. No frequency or pain was present. A mass was felt in the left flank, which was attached to the kidney and descended on deep inspiration. Cystoscopy was done and the pyelogram showed the left pelvis to be displaced upward and toward the mid-line, while the lower calyces were obliterated.

Comment.—This patient has been well for four years since his nephrectomy. One should endeavour to diagnose these cases earlier than one year after the onset of symptoms. Unfortunately, they often do not consult their physician, as happened with this patient.

CASE 7

A male, aged 65, had clots of blood in the urine for three days only. No frequency and no pain were present. A small mass the size of a golf ball was felt, attached to the lower pole of the left kidney. The left pyelogram showed a distinct filling defect in the lower pole of the kidney.

Comment.—This growth was diagnosed very early after the onset of symptoms, and there was a very good chance of cure. The patient refused operation and died two years later with secondaries over most of his body.

CONCLUSIONS

1. Frequency, pain, hæmaturia, dysuria and retention are symptoms of cancer as well as of other local conditions in the urinary tract.
2. Any variation in the normal function of the bladder must be investigated early and a diagnosis made, as one of the causes of these changes is cancer in the urinary tract.

INTRAVENOUS INJECTIONS OF ANIMAL CHARCOAL IN THE TREATMENT OF VARIED INFECTIONS: A CLINICAL AND EXPERIMENTAL STUDY*

BY EUGÈNE ST. JACQUES, M.D., F.R.C.S.(C.),

Surgeon to the Jeanne d'Arc Hospital,

Montreal

WITH intravenous injections of animal carbon we have a new means of treating very many infections, be they purely medical or complicating surgical interventions. We have been experimenting during the last year with this method of treatment in a great variety of infectious conditions and will here report on the results in over 150 cases and over 300 intravenous injections, with not a single untoward result. In my opinion the method is safe and efficacious.

A year ago Professor Conklin, of Macdonald College at Ste. Anne de Bellevue, Que., proposed to a group of surgeons a new treatment against infections. In the *Cornell Veterinarian* he had already, in 1928, published some of the basic facts concerning his experiments. Up to this date, he and his associates had treated 738 cases of varied infections in animals with uniformly good results and cure in all of them. But in human beings the method had only been tried once in a case of rebellious furunculosis following an acute gangrenous appendicitis, which had been lingering on with recurring exacerbations for 18 months; one single intravenous injection of carbon definitely cured the furunculosis, it was reported eighteen months later. That was where the matter stood when it was presented to us by Professor Conklin. Acting on this clue, we thought of verifying on the human being, so as to see for ourselves, the possibilities of this new method of combatting various infectious processes. What had been Conklin's biological findings to date? He reported that the carbon particles of the colloidal preparation were partly absorbed by the spleen, liver and bone marrow, whose endothelial cells seemed to have been hyperactivated. As for the blood, the polymuclear cells seemed to increase in number and were actively engaged in

phagocytizing the remaining particles of carbon as well as the bacterial agents.

From this basis we started experimenting. Prudence was naturally in order. So we began with small doses of a 2 per cent suspension of animal charcoal in distilled water. One c.c. was our initial dose and gradually we crept up to 2, 3, 4 and 5 c.c. At the present time our routine is to give 3 to 5 c.c., intravenously, according to the severity of the infection. We have been inclined to give the higher doses.

To date we have given over 300 intravenous injections of charcoal in over 150 patients with not one single untoward sequel—no generalized uneasy sensations, no chill, no headache, no *choc hemoclasique*. In some cases a slight rise in the temperature occurred in the hour following the injection. Nothing was noted in the blood picture to cause any anxiety; nothing, so far as the urinary functions went. The general circulation was unaffected in any way. In short, the procedure was perfectly innocuous. We may perhaps mention that two very nervous women showed on the following day a slight diarrhoea—a mere coincidence, we thought.

Charcoal, intravenously, has been tried in certain quarters, as was reported to me, in animals with bad results. Evidently there was in these cases a faulty technique or over-dosage. Conklin, however, claims that charcoal is absolutely innocuous. The method has also been tried in Paris on animals with no untoward results, and the animals which died were those to which, intentionally, particularly high doses in regard to the weight of the animals had been given. No matter what have been the results on animals, let me say without hesitation that in human beings 5 c.c. doses have been altogether harmless in over 150 patients receiving more than 300 injections. Facts are facts.

Now as to the results. Let us analyze the first 100 cases, which were not picked ones. They

* A paper presented before the Academy of Medicine, Paris, January 30, 1934.

were all the infectious cases taken in one after another as they presented themselves in the different services of the Jeanne d'Arc Hospital in Montreal. In some of them a cure could not be expected, but we wanted to give charcoal an honest and fair trial. For example, we could not expect to cure a woman suffering from a tuberculous enteritis, complicated by a large solid tumour of the rectum, a tuberculoma as it appeared to us during a laparotomy. The temperature dropped somewhat, but the infectious process kept on and finally carried her off. In one other case, of acute articular rheumatism affecting both knees and one wrist, with an active endocarditis, salicylate was suspended and carbon given. To our surprise the pain disappeared completely within 48 hours. So much so that the patient could move her limbs freely. On account of the valvular lesion salicylate was resumed, and she left the hospital with active movements, no pain, but still carrying, of course, her heart lesion. A third case, of chronic deforming arthritis with an acute pyretic attack, and running a high temperature, was not improved. These 3 out of 100 patients were the only ones who were not cured of their infectious process.

What about the results in the remaining 97 other cases? I have divided these into three classes:—

(a) The *convincing* cases, because the temperature dropped to normal within 48 hours and all were cured. There were 50 belonging to this class, that is 50 per cent.

(b) The *good* ones, where the temperature, though coming down to normal, only dropped gradually during 5 to 7 days; all of them were cured. There were 31 of these, roughly one-third.

(c) The remaining 19 cases, 20 per cent, belong to the *unconvincing* class, because varied medication or vaccine, etc., were also used.

Let us now go over the list of diseases treated; the variety is a large one.

1. *Acute metro-salpingitis*.—There were 16 cases, the majority of them of gonococcal origin—6 convincing cases; 6 good ones; 4 unconvincing.

This disease seems the most stubborn in its reaction to carbon, which is nothing to be surprised at when one remembers the easy and extensive peritoneal reactions which occur in the pelvis in such cases.

OBSERVATION No. 48

A patient with uterine fibroid, markedly infected, with acute parametritis, who had been laid up in bed at home for 3 weeks. She had pains, with a temperature of 100°. Three c.c. of charcoal were given, with rapid disappearance of pain and lowering of the temperature to normal, whilst the pelvis cleared up in a short time.

OBSERVATION No. 10

Multiple uterine fibroids; intracervical infected polypus; severe anaemia from hæmorrhage. After due preparation, a total hysterectomy was done. Between January 13 and the following days the temperature oscillated between 99 and 101°; on January 18 the temperature was 101°. Charcoal, 3 c.c., was administered. The temperature dropped immediately to 99° and remained at 98-99°. Healing occurred *per primam*.

Metro-salpingitis complicated by ovarian cyst or fibroma.—All the patients were hysterectomized: 17 cases—7 convincing; 7 good, 3 unconvincing. All recovered nicely.

OBSERVATION No. 8

Mrs. C., hysterectomy on February 18. On February 20, the temperature was 102.3°. Charcoal, 3 c.c., was given. Within 48 hours the temperature was normal and remained there.

2. *Acute puerperal infections*.—Fourteen cases brought from outside.

OBSERVATION No. 5

Mrs. F., placental retention. Temperature 104°. Uterine curettage. Charcoal, 3 c.c., was given. On the next day the temperature was down to normal and stayed there.

Of the 14 cases, all were cured—9, rapidly (classed as convincing); 4 good; and 1 unconvincing.

3. *Phlebitis*.—Three cases developed phlebitis. Charcoal in phlebitis has usually a rapid effect on the pain and shortens the duration of the disease, so it has appeared to us. One of these patients was up and around on the 20th day.

OBSERVATION No. 11

Blood culture was positive for staphylococcus. Temperature 105°. On the 15th day the patient received charcoal, 4 c.c. The temperature fell very gradually to normal, which it touched on the 29th and remained so. The patient was cured.

OBSERVATION No. 123

Puerperal septicæmia. Blood culture was positive. Phlebitis. The patient was delivered at home, and arrived on February 4, badly infected and deeply anæmic from loss of blood. Blood: red cells 2,300,000; hæmoglobin 37 per cent; temperature 102°. On February 5 the temperature was 104°. Charcoal, 5 c.c., was given. February 6, temperature 102°. Charcoal, 5 c.c., was given. February 7; transfusion of 100 c.c. of blood from husband. Blood culture was positive. On February 8, 9 and 10 she received 4, 5, and 3 c.c. of charcoal. February 11, first signs of phlebitis. On the following days the temperature oscillated between 100 and 102°, and the patient received 6 further charcoal injections—11 in all up to date. February 25. General and local improvement was evident. The temperature was down to 99°. For many days previously the legs had been painless, the usual effect of carbon injections. March 5. Temperature 99°. The patient was doing nicely. Blood culture was negative.

4. *Perineal lacerations*.—All of the third degree brought from outside, 7 cases. Two of the patients were particularly badly lacerated and infected. After disinfection and sufficient preparation they were operated on early, in order to close the door against further extension of the infectious process; both healed *per primam* after having received charcoal injections. Six convincing cases; 1 good.

5. *Lung infections*.—Five cases of pneumonia and post-operative congestion with fever.

OBSERVATION No. 1

Pneumonia of 3 weeks' duration, with successive foci developing. The temperature was running between 103 and 104°. One single injection of charcoal brought the temperature down to normal on the following day, where it remained, whilst the lung cleared up rapidly.

OBSERVATION No. 25

Acute post-operative (goitre) bronchitis. Temperature 102°. Charcoal, 3 c.c., was given. The temperature was down to normal in 48 hours and cure was rapid.

OBSERVATION No. 39

Pneumonia complicated by pleurisy. This was cured in 8 days, but classed only as a "good" result.

OBSERVATION No. 44

Pleurisy with sero-fibrinous exudate, as shown by aspiration, was cured in 6 days by a single dose of charcoal, classed only as a "good" result.

6. *Acute cholecystitis*.—Three cases.

OBSERVATION No. 3

Mrs. T., aged 58 years. She had been laid up in bed at home for 8 days. For 5 consecutive days in the hospital her temperature ranged from 100 to 100.3°. Charcoal, 3 c.c., was given. The temperature was normal next day. She was operated on 5 days later—cholecystectomy for a gall bladder filled with muco-pus and stones. Healing was *per primam* and cure was rapid and complete.

OBSERVATION No. 2

Cholecystitis complicated by pancreatitis. Mr. O.L., aged 58. His temperature was 101° on arrival at midnight; acute epigastric pain. Sugar was present in the urine; blood sugar = 2.03 grams. There was a leucocytosis of 13,000. January 2. Temperature 101°. Charcoal, 3 c.c., was given. January 4. Temperature 98.3°. January 5. Temperature 101°. He was given again charcoal, 3 c.c. January 6. Temperature normal and it remained normal. He left quite well, 10 days later, without pain; no sugar; no operation.

7. *Furunculosis*.—Here charcoal reigns supreme. Within 48 hours there is no more pain and the boils dry up rapidly. We have had many cases; a few injections seem to bring a definite cure.

8. *Acute gonorrhœal arthritis*.—One case.

OBSERVATION No. 59

A severe case. The wrist was very œdematous and painful. Temperature 100 to 102°. Charcoal, 3 c.c., was given. (We were not then accustomed to giving higher doses). Three successive injections were given

at two-days' intervals. On the 6th day movement of the wrist and fingers was possible. From the 7th day the temperature was normal. From the 18th day movement was easy and painless. When seen 6 weeks from the beginning the movements of the wrist and hand were quite normal and easy.

9. *Gonococcal epididymitis*.—Charcoal acts marvellously within 48 hours against pain—so rapidly in 3 of our 4 cases that we are inclined to look upon it as a specific in this class of case.

10. *Pyonephrosis*.—Three cases in which charcoal was both effective and convincing.

OBSERVATION No. 59

Miss G., aged 25, suffering from pyocyanic pyonephrosis, as shown by a culture from the urine. This was the only case of pyocyanic infection of the kidney seen in 30 years' practice. The right kidney was enlarged and painful, and for a time we believed she would require nephrectomy. She was admitted on April 7, with a temperature of 100.2°. After a few days' observation and washing of the kidney pelvis she received at intervals two doses of charcoal, 3 c.c., which were not effective. April 21. Temperature 101°. The patient received Delbet's anti-pyocyanic vaccine, 2 doses; not effective. We gave on April 27th 3 c.c. of charcoal. April 29. Temperature 100°. Charcoal, 3 c.c., was again given and we found the temperature dropping to normal and remaining so. She received two other injections to insure maintenance.

May 10. No temperature, but *B. pyocyaneus* still present in the urine. May 20. She still had no temperature. Bacilli no longer present in the urine.

October. General condition perfect. She has put on weight. A few *B. coli* in the urine. February, 1934. She was reported to be in the best of health. No operation was done.

Pyonephrosis consecutive to puerperal infection.—

OBSERVATION No. 93

March 8. The patient was so ill that she used to lose consciousness. Temperature 103°. Charcoal, 3 c.c., was given. March 10. Temperature 100°. *B. coli* in the urine. Charcoal, 3 c.c. (we were still giving small doses). March 11, temperature 98°. March 13, temperature 100°. Charcoal, 3 c.c., was given, and the temperature dropped gradually to normal in 4 days and remained so.

April 24. The patient left the hospital quite well. When seen later she was still quite well and pregnant. She returned in February, 1934, to the hospital for a normal delivery.

Such are the results obtained from the use of animal charcoal given intravenously in a variety of infectious processes. It is not our claim that the method is a panacea, but in our hands it has proved both very effective and absolutely harmless. These first 100 cases were treated as they came up, without selection, and with small doses. Since then we have been using charcoal in all infected cases in our own service and those brought to our attention by our hospital colleagues. We have increased the dose, and now give for mild cases 3 c.c. to begin with, increasing to 5 c.c. In severe cases we

gave as many as 8 injections, usually at two-day intervals. Charcoal can be given every day in succession. No untoward sequel has ever been observed.

These clinical observations from the research department of the Jeanne d'Arc Hospital are submitted as mere suggestions for further experimentation. Perhaps the dosage can advantageously be carried higher; perhaps the field can be extended; we believe so.

In acute appendicitis, operated upon, charcoal will insure a safer and shorter convalescence. We have also found it particularly effective lately in three cases of acute parotitis, two of which followed abdominal operations. In both cases it stopped short the course of the disease and brought about rapid cure.

METHOD OF EMPLOYMENT

The preparation is a 2 per cent suspension of

animal charcoal in distilled water. At first we had it prepared in our hospital laboratory and used Merck's animal charcoal. As its use became more general we now have it prepared by the Poulenc Chemical Laboratories (Rougier Frères, Montreal) who put it up in 5 c.c. ampoules and 10 c.c. rubber-stoppered bottles, all sterilized and ready for use. An important precaution is that the piston, syringe barrel and needle must be paraffined beforehand to prevent clogging by the particles of carbon. We use sterilized paraffin.

The charcoal method is both effective and innocuous, and deserves to be further tested. Clinical records must stand against any theoretical objection. How charcoal acts is a biological secret up to the present. All we know is that it stimulates phagocytosis as well as the endothelial cells of the spleen, liver and bone marrow.

SOME CLINICAL FEATURES OF COMPLETE HEART-BLOCK*

By KEITH GORDON,

Montreal

WE have recently had under observation, for a second time, a patient in whom a condition of complete heart-block had become established about four years previously, and whom we had not seen clinically since that date. What aroused our interest in him was the presence of some features which were not apparent when we last had an opportunity to examine him. The heart had increased in size, marked capillary pulsation was apparent in the nail beds, and the blood-pressure readings, which were normal at the onset of the heart-block, presented high systolic and relatively low diastolic figures; yet the pulse was not collapsing in type nor were any of the other clinical signs of aortic insufficiency present. The question was at once raised,—“Are these findings characteristic of complete heart-block?” It was problematical as to whether we were dealing with evidence of progressive degenerative processes in the cardiovascular system, or whether the prevailing hypertension and cardiac enlargement were compensatory in nature, resulting from an effort on the part of

the slowly-beating ventricle to provide the tissues with an adequate supply of blood. The opinion of a worker¹ in a separate clinic was sought, and it was learned that similar blood pressures had recently been observed by him in a young woman with complete heart-block, and the same doubt expressed as to their nature. The better known works of references were conspicuously void of comment in the matter, with the exception of this statement in a recent work of Lewis²: “Simple slowing of the heart fails to produce a material lowering of mean blood pressure. It raises the systolic pressure and lowers the diastolic pressure: the heart accommodates itself to the increased quantity of blood returning to it in diastole, throwing it out at each systole.” And, again, “In using systolic pressure to gauge whether the condition of essential hypertension is present or not, it is to be remembered that when the pulse pressure (or the difference between systolic and diastolic pressures) is large, as in aortic regurgitation; or when the ventricular action is very slow, as in complete heart-block, the systolic pressure rides 10 to 20 mm. higher than it otherwise would.” A more careful

* From the Department of Medicine, Montreal General Hospital.

that the probable error is sufficiently small to make the observations significant. It would appear that enlargement of the heart, occurring in all 9 cases, is significant. This confirms the observations of Willius and others. In 8 consecutive cases the systolic blood pressure was relatively high and the pulse pressure wide, confirming the observations of other writers. This is probably significant. The one case in which normal blood pressure readings were recorded was the youngest of all of those in the group. We were unable to establish any definite relationship between the abnormal type of blood pressure observed and the presence, or absence, of arteriosclerosis, since there was neither a consistent record of examination of the eye-grounds, nor examination of the peripheral vessels by means of the x-ray. Neither were we able to establish an association between the duration of the heart-block and the finding of abnormal blood pressures and enlargement of the heart, although the findings in the one case which we had an opportunity to examine after an interval of four years would tend to make us suspect that there is an association. In further support of this probability is the recent publication of Campbell and Suzman,¹⁰ who in a review of 8 cases of congenital complete heart-block, found abnormal blood pressures in the three older cases, aged 19, 21, and 26, respectively. In the remainder, the figures were normal. The writers state that there was no evidence of renal disease or arterial change in any of their cases. No conclusions or opinions could be made with regard to etiology, although it is worth noting that there was a complete absence of a history of diphtheria in our series, as opposed to the findings of Butler and Levine¹¹ who, in a series of 20 cases of heart-block, obtained a history of diphtheria in 50 per cent, as compared with an incidence of 6 per cent in 600 surgical control cases. The selection on the part of these writers of a group of surgical patients as a control is open to criticism, since it is well known that the average age of a large surgical group is considerably lower than that of a medical group of the same size. It is not unlikely that the majority of the surgical cases of today began their life in an era in which

diphtheria has been a relatively rare disease, and that the converse is true of the majority of medical cases.

In the case observed outside the hospital, and which we have not included in the analysis, we were of the opinion that the first heart sound at the apex varied from time to time in quality and intensity. A mechanical method of proving the presence or absence of this phenomenon was suggested to Dr. C. C. Birchard, Director of the Department of Electrocardiography, Montreal General Hospital, and in the near future he and the writer will report the results of this investigation.

CONCLUSIONS

We are of the opinion that once a condition of complete heart-block is established the left ventricle of the heart becomes enlarged and the systolic pressure becomes elevated, because of an increase in blood mass discharged per stroke, in order to maintain a satisfactory circulation of the blood in compensation for a slow ventricular rate. We are also of the opinion that the wide pulse pressure found in association with this condition is due to a prolonged flow-off time.

This analysis suggests that the diagnosis of complete heart-block can be made clinically in the majority of instances, and without the aid of graphic methods. The main diagnostic features would appear to be, in order of importance: (1) a slow pulse with regular rhythm; (2) enlargement of the heart; (3) high systolic blood pressure; (4) wide pulse pressure; (5) a history of syncope attacks; (6) variability of the first heart sound; (7) a capillary pulse.

REFERENCES

1. BROW, G. R.: personal communication.
2. LEWIS, T.: Diseases of the heart, Macmillan Co., Lond., 1933, p. 99.
3. *Ibid.*, p. 231.
4. MUSSER, J. H.: Heart-block associated with high blood pressure, *Arch. Int. Med.*, 1917, 20: 127.
5. WILLIUS, F. A.: Clinical study of complete heart-block, *Ann. Clin. Med.*, 1924, 3: 129.
6. ELLIS, L. B.: Studies in complete heart-block: clinical analysis of 43 cases, *Am. J. M. Sc.*, 1932, 183: 225.
7. READ, J. M.: Complete heart-block, *Arch. Int. Med.*, 1930, 45: 159.
8. WHITE, P. D. AND VIKO, L. E.: Clinical observations on heart-block, *Am. J. M. Sc.*, 1923, 165: 659.
9. GILCHRIST, A. R.: The action of atropine in complete heart-block, *Quart. J. Med.*, 1933, New Series 2: 8: 483.
10. CAMPBELL, M. AND SUZMAN, S. S.: Congenital complete heart-block, *Am. Heart J.*, 1934, 9: 3, 304.
11. BUTLER, S. AND LEVINE, S. A.: Diphtheria as a cause of late heart-block, *Am. Heart J.*, 1930, 5: 592.

NOTES ON ONE HUNDRED OBSTETRICAL CASES IN RURAL PRACTICE*

By A. F. McKENZIE, M.D.,

Monkton, Ont.

ALL of the cases in this series, with one exception, occurred in private homes. Seventy-six per cent of these homes were farm houses. One case to which reference will be made later took place in a hospital. There were no maternal deaths. The series is consecutive, but does not include abortions, miscarriages, or premature births occurring before the end of the seventh month, nor does it include cases under the care of other practitioners to which I was called as anesthetist or consultant.

The hundred cases consisted of 81 mothers, and of these 25 were primiparae, the youngest of whom was 17 and the oldest 35. The oldest multipara was 46. This woman had previously given birth to 13 children, 12 of whom were living. The next oldest multipara was 44. Her only other child was nearly 18 years of age. There had been no intervening pregnancies.

One of the problems of rural obstetrics is that of nursing. In this series a trained nurse was in attendance in 15 cases. In 20, a practical nurse was present. By "practical nurse" I mean a woman who charged for her services, but had no special training. As might be expected, these women varied a great deal in experience, intelligence, cleanliness, and capability to carry out instructions. In the remaining 65 cases, the assistants and nurses were relatives or friends. In approximately 60 per cent of the cases I was consulted prior to the advent of labour, or at least notified that my services would be required about such a time. In the remaining 40 per cent my first knowledge of the pregnancy was when I was called to attend the patient in her confinement.

CASE 72

This patient, aged 35, was the oldest primipara in the series. She was of medium height but very stout, weighing about 190 lbs. She gave rise to a good deal of anxiety on account of (1) nausea and occasional vomiting, which continued throughout the whole pregnancy; (2) her rather advanced age for a primipara; (3) the probability of a large child; (4) a

systolic blood pressure ranging around 155 and a diastolic always above 90. There was no albuminuria. Salt was withheld from her diet as much as possible and the proteids restricted. The patient was a great worker and kept on her feet most of the time in spite of the nausea. On the day preceding her confinement she came to my office and stated that she had had some flashes of light before her eyes. Her systolic pressure was 165 and the diastolic 110. Some phenobarbital was given. Next morning I was called and found her in labour. She had some headache and the systolic pressure was 200 and the diastolic 120. Phenobarbital was again given and in a few hours the systolic pressure had dropped to 175 and the diastolic to 115. The labour was difficult, the presentation being occipito-posterior. The baby weighed 10½ lbs. and suffered a fracture of the humerus during the delivery of the shoulders. An examination of this patient two years later showed a systolic pressure of 180 and a diastolic of 105.

CASE 77

A primipara, had hypertension, oedema and albuminuria. During the last few weeks of pregnancy she was kept in bed most of the time. Labour was comparatively easy. A few weeks after confinement the urine was free from albumin and the blood pressure was normal.

CASE 7

A primipara who was in convulsions when I first saw her. She had twenty-five convulsions, about one-half before delivery and one-half after. The last occurred seven hours after delivery. The patient was treated by morphine, bleeding, and other conservative measures. Dilatation of the os was assisted by the insertion of a rubber bag. The baby weighed 4½ lbs. and lived. In this case the highest systolic pressure recorded was 180 and the diastolic 120. The urine contained a great deal of albumin. Eighteen months later I attended this woman in her second confinement which was normal.

External pelvic measurements were taken of 17 patients, 12 of them being primiparae. A review of these measurements in connection with the clinical course of the cases shows them to be interesting and probably useful, but they should be considered along with other factors and too much importance should not be attached to them unless the departure from what is generally accepted as normal is pronounced. Thus Case 72, primipara, aet. 35, whose pelvic measurements were all above the average, had about as hard a labour as Case 60, primipara, aet. 30, whose measurements were the lowest of all those taken, the sacro-pubic being 18 cm. instead of the normal 20 cm. Drugs were seldom given in the first stage of labour for the purpose of relieving pain. We have no way of measur-

* Read at the Annual Meeting, in Toronto, of the Ontario Medical Health Officers Association on May 29, 1934.

ing the intensity of this pain and when it starts we cannot tell how long it is going to last. Something can be accomplished by suggestion. If the practitioner is able to assure the patient that she is having normal labour pains, that they are accomplishing their purpose, that everything is all right, and that she will not be allowed to suffer unduly, this will, in most instances I think, tide her over the first stage while retaining her senses and ability to cooperate with the practitioner and attendants. Of course there is the exceptional case in which the practitioner feels that he has got to give something. I have had no practical experience with the newer drugs, which are said to be amnesies rather than analgesics. While trying to keep an open mind, I feel, at present, that so far as the general practitioner is concerned, these, along with the older drugs, should be reserved for the exceptional cases and not regarded as routine necessities.

The second stage of labour is different. Most women, sooner or later, demand something to relieve the pain. We know, approximately, how long this stage should last, and quite frequently procedures are required which the modern civilized woman will not tolerate without an anaesthetic. In this series I relied almost entirely on chloroform. In four instances other practitioners were called in to give the anaesthetic and they used ether. One rule which I always try to follow is to not commence chloroform until the os is fully dilated or easily dilatable, and I have made a diagnosis of the presentation and conditions are such that I think I can, if necessary, complete delivery within a short time.

There were two cases of twin pregnancy.

Presentations.—There were two breech presentations. Of the vertex presentations, one was diagnosed as left occipito-posterior and 18 as right occipito-posterior. Occipito-posterior presentations are responsible for a large proportion of prolonged and difficult labours, and it is not always easy to determine what is the best treatment for any particular patient, as will be illustrated by the following cases.

CASE 85

This woman had previously given birth to three children. She had been in labour some time when I was called. She complained that the pains were more severe and seemed to do her less good than in her previous confinements. An occipito-posterior presentation was diagnosed, and I thought it would be advisable to perform rotation. I started to sterilize the instru-

ments when the patient suddenly called me and after a few very severe pains the child, which was a large one, was spontaneously delivered with the occiput posterior. There was a small laceration of the perineum requiring one stitch.

Spontaneous delivery with the occiput posterior must, I think, be rather rare, as I can recall only one other case in my own experience. The normal mode of delivery is for the occiput to rotate forward before the birth of the head. Six of the cases in this group spontaneously rotated and were delivered without assistance.

CASE 2

This woman had previously given birth to one child without special delay or difficulty. Labour in this instance commenced with rupture of the membranes. I saw and examined her six hours later and diagnosed an occipito-posterior. The os at that time was only slightly dilated. About 14 hours after the rupture of the membranes an examination showed the os to be dilated to about two inches in diameter. By this time the friends were getting anxious and I was tired of waiting. As the pains appeared rather weak 0.8 c.c. of pituitrin was given intramuscularly. Almost immediately strong pains came on and the patient cried out for chloroform. The child was born with the occiput anterior in less than fifteen minutes after the pituitrin was given.

Three other cases were satisfactorily treated in the same way, the doses of pituitrin being 0.5 c.c. or less. How much risk was run by the use of pituitrin? This is difficult to answer. The four women had all previously borne children without any special trouble. Except in the first case the dose of pituitrin was comparatively small and was not repeated. In a fifth case 0.5 c.c. pituitrin caused severe pains but did no good. This was a case of mistaken diagnosis; I thought the occiput was anterior. The mistake was due to the presence of a false fontanelle and the correct position was not diagnosed until the hand was pushed up sufficiently high to feel the ear. Delivery was completed in this case by manual rotation and the use of forceps. I would hesitate to give pituitrin in a case of occipito-posterior presentation in a primipara.

Spontaneous rotation not having occurred in a reasonable length of time, and a single dose of pituitrin having failed or been decided against, I next resort to manual rotation. I always have the forceps sterilized and ready, but do not always use them after effecting rotation.

In Case 18 spontaneous delivery occurred about 15 minutes after manual rotation. In Case 91 a small dose pituitrin was given after manual rotation and delivery soon followed. In the remaining 6 cases of this group, forceps were

applied after manual rotation and delivery was completed with them.

There were two face presentations. Case 27, with the chin anterior, was treated by leaving it alone and spontaneous delivery occurred in due time. In Case 49 the chin was posterior. The os was fully dilated and the membranes intact. There was no descent. The patient was chloroformed. One hand was inserted and pressure upwards made on the jaw, while with the other hand pressure downwards was made on the occiput. The presentation was thus converted into an occipito-anterior and as soon as the head was thought to be sufficiently engaged 0.5 c.c. pituitrin was given and a large child was soon spontaneously delivered.

Forceps were used altogether in 18 cases. There was unusual difficulty in delivering the shoulders in two cases, in one of which the humerus and in the other the clavicle was fractured.

CASE 44

A multipara had marginal placenta prævia. As there was very little dilatation of the os, when first examined, the vagina was plugged and small doses of pituitrin given. Another practitioner was sent for. At the end of about four hours the os was well dilated. The patient was anesthetized with ether. The presentation was occipito-posterior and delivery effected by manual rotation and use of forceps. Both mother and child did well.

The placenta was manually removed in one case. The membranes were manually removed in three cases—twice in the one patient.

There was one rather severe case of post-partum hæmorrhage, coming on about 1½ hours after delivery of the placenta in a case of twin pregnancy. This was Case 24, and up to this time I had been using dry sterilized gloves and found them satisfactory. Having decided to insert the hand into the uterus I was disconcerted to find that the remaining gloves I had were brittle and useless. I therefore used the bare hand without any ill results. Since then I have discarded dry sterilization and boil the gloves, which is one of the first things I do when called to a case.

There were 3 cases of delayed post-partum hæmorrhage coming on about two weeks after confinement. The first was due to a retroverted uterus. The uterus was replaced, some clots expelled, and a ring pessary inserted. An examination of the second case showed a dilated os, within which a piece of retained placenta could be felt. The patient was anesthetized by an-

other practitioner and the placental tissue was removed with the gloved finger and blunt curette. An examination of the third case showed no abnormality other than the bleeding. This eventually proved to be one of those cases in which the mother menstruates regularly while nursing her infant.

There were 4 still-births. Two of these were anencephalous monsters, both occurring in primiparæ. The succeeding pregnancies in both these cases were normal. Syphilis is given as one cause of these monstrosities. In one of the cases a Wassermann test was made and was negative. One of the breech cases was still-born. The fourth still-birth was due to allowing the pregnancy to go three weeks over time. This patient had a contracted pelvis, the sacropubic measurement being 18.5 cm., the second lowest of all those measured. The presentation was normal. Delivery with the forceps was prolonged and difficult, owing partly at least to the rigidity of the child's head. The child weighed 7 lbs. The mother had no puerperal complications and made a good recovery. If this woman became pregnant again and were under my care, I think I would induce labour at or before the expected time.

There were no crippled children and, so far as I know, there were no deaths within the first year, as contrasted with an average death rate of over 6 per cent throughout the province for 1932.

During the puerperal stage, the following complications occurred: Case 66 was one of the patients from whom the membranes were manually removed. She ran a slight irregular elevation of temperature for about two weeks. She made a good recovery and in her next confinement I again removed the membranes manually and no fever followed.

Case 31 was one of the anencephalous cases previously mentioned. As there was persistent rather free hæmorrhage and as the placenta could not be removed by expression, it was decided to remove it by hand. The breasts became intensely engorged and painful and on the third day her temperature was 102.2°, pulse 130. Next day coincident with an improvement in the breasts, the temperature dropped to 99.8° a.m. and 101.2° p.m. For about ten days there was a slight evening rise of temperature and the pulse continued to run over 100. The rapid pulse was partly attributed to the con-

siderable amount of blood she lost before the removal of the placenta.

Case 78, a multipara developed phlegmasia of both lower extremities. She was kept in bed for six weeks and made a good recovery. Case 55 had an abscess of the right breast. The first symptoms came on 19 days after delivery. The abscess was opened 13 days later.

At the commencement of this paper mention was made of one case of the series which I attended in a hospital. There was no special reason why this patient should have gone to the hospital, except that previous to her marriage she had been a trained nurse, and thought that the hospital was the proper place for a woman to have a baby. Perhaps she was right. A good deal can be said on both sides of the question. In my undergraduate days the hospital was regarded as an unusual place for a woman to have

a child, but now the trend of custom seems to be in favour of the hospital. The earliest available statistics for the relative frequency of institutional and non-institutional births in this province are those for 1929. In that year 34.1 per cent of the births were institutional. In the year 1932 this had risen to 39.4 per cent. At the same rate of increase, by the year 1938 they will be about equal. Is this increase of institutional obstetrics a good thing? What about the question of safety? In the year 1932 the maternity death rate for the whole province, per thousand living births, was 5.1. The non-institutional rate was 2.3 and the institutional rate was 9.3, or four times as great. Statistics however may be variously interpreted and it would be unwise at the present time to draw definite conclusions on this controversial subject.

HUNTINGTON'S CHOREA, WITH THE REPORT OF A CASE

By CLARENCE A. BUCK, M.D.,

Toronto Psychiatric Hospital,

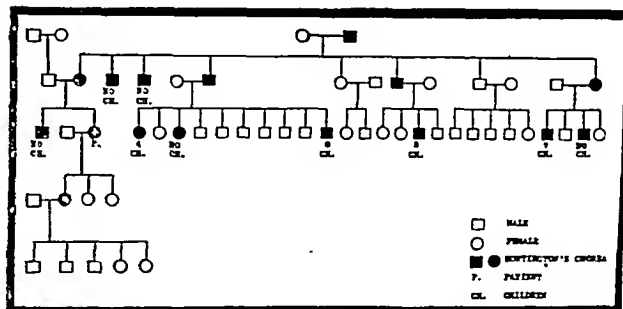
Toronto

THE family tree depicted here shows 16 cases of Huntington's chorea in a family history in which 32 persons came in the direct hereditary line. Although a number of those in the third generation, most of the fourth, and all of fifth generation have not yet reached the age-group when the symptoms appear, yet this tree fairly closely follows the Mendelian theory of heredity. It will be noticed that two members of the second generation escaped the disease, and since the hereditary chain was broken no cases of the disease have appeared in their offspring. In this particular group the earliest age at which symptoms were noticed was 20 years, while the latest before symptoms appeared was 55 years. In the majority of the cases however the symptoms first appeared during the fourth decade.

CASE REPORT

Personal history.—A female, aged 61. Her birth was normal and childhood uneventful. She attended school from six to fourteen years of age, going as far as the fourth book. She is described as always being a rather quiet, reserved type of person, who preferred to remain at home and took very little interest in outside activities. She was married at the age of 16 years and had three daughters. Her past medical history is essentially negative.

Attention was first called to her present condition by a physician who was visiting another member of the family. At that time the patient was about 45 years of age. The symptoms manifested at that time were weakness of the muscles of the eyes (inability to look upwards), and some weakness of the lower extremities, with a tendency to drag the left foot. The condition gradually progressed with noticeable weakness of the whole musculature, more particularly of the left side. She frequently complained of crampy pains in her arms and legs. She also began to neglect her work, was untidy in her personal appearance, and showed a general loss of interest.



Choreiform movements were first noticed at the age of 47. At the age of 54 mental and physical enfeeblement were so marked that she was unable to care for herself. She would fall on the floor frequently, cry out, and become abusive when annoyed. Memory for more recent events was noticeably impaired. She was then placed in a home for the aged. For the past year she has been bedridden, due to the paralysis. She was admitted to hospital in February, 1933, because the degree of mental deterioration made it difficult to care for her in the home.

At this point I would like to draw attention to the fact that although this patient was suffering from a definite neurological disorder from at least the age of 45 years she did not come under medical care until she was 61 and so far as I could ascertain no official diagnosis had been made up until the present time. The reason for this, apparently, was that the relatives looked upon it more as a family problem rather than a medical condition.

Physical examination.—A rather emaciated female patient, aged 61 years, and weighing 99 pounds.

Digestive system.—Incisors were greatly worn down by continued choreiform movements which produced a lateral movement of the jaws. There was difficulty in swallowing owing to muscular weakness.

Circulatory system.—A moderate degree of arteriosclerosis. Blood pressure, 140/80.

Respiratory system.—Negative.

Nervous system.—There was general muscular weakness involving all the muscles of the body. There were continual choreiform movements of head, neck and extremities (absent during sleep). The deep reflexes in the upper and lower extremities were equal but exaggerated. The pupils were equal; reaction normal. The fundi could not be examined owing to fairly well marked cataract in each eye.

The patient was unable to stand or walk because of weakness of the muscles and extremely poor voluntary control. Articulation was poor. There was a marked blurring of speech, with a tendency to run the syllables together, especially the consonants. Sensation was not impaired. The laboratory examination of the blood, urine and cerebrospinal fluid was negative.

Mental examination.—Articulation was so poor that it was difficult to understand what she said. All her reactions were very childish. There was an extreme superficiality of emotions; she was easily angered or pleased. Little spontaneous interest was shown. Orientation was poor. In the temporal sphere she could usually give the day of the week correctly, but had no idea of the month or year. As to place, she realized that she was in a hospital of some sort, but nothing further could be elicited. In the personal sphere she could give her own name and knew the status of some of those about her. Perception was not disturbed. Memory for both past and recent events was much impaired. There was an almost absolute poverty of ideation. She could answer simple questions only, and made very little attempt at spontaneous conversation. She had very little insight into her condition, being only able to recognize her physical impairment, but having no idea of her mental enfeeblement.

DISCUSSION

History.—The first mention of this disease was made by Waters, of New York, in 1841, who recognized the affection as a distinct entity. It was fully described by Huntington, of Long Island, in 1871. He belonged to a medical family who had been practising on Long Island for many years, and consequently he was able to state the definite hereditary characteristic of the disease.

Etiology.—The disease usually begins during the fourth decade of life, though it is occasionally seen in younger people. The onset before the age of 21 years or later than 60 is a rare possibility. Certain early symptoms may commence years before the syndrome becomes fully developed; these may consist of slow-

ness in performing ordinary movements, slight chorea, or mere clumsiness. A few cases have been reported as occurring in childhood, but there is some uncertainty as to their real etiology. Students of genetics put forth the theory of mutation as a probable etiological explanation.

Distribution.—The disease appears to be commonest in North America, but has been described in countries all over Europe and South America. Several cases have been reported in negro families, associated with other nervous maladies, the most important being epilepsy.

Heredity.—Huntington's chorea is primarily an hereditary disease, and follows the Mendelian laws pursuing the dominant factor. When one or both of the parents have shown manifestations of the disease it almost invariably occurs in one or more of their children. Once the hereditary chain is broken, however, the disease never recurs in the offspring unless they marry into a family containing the dominant strain.

Pathology.—The most constant findings in these cases are diminution in the size and weight of the brain, the reduction being chiefly, if not entirely, in the forebrain, which shows marked atrophy of the convolutions, the white matter, and especially of the corpus striatum. By actual count of the nerve elements of the corpus striatum it has been found that they are very definitely reduced in number.

Symptoms.—The symptoms develop slowly. Clumsiness and difficulty in performing delicate actions or personal neglect may be the first signs. Choreiform movements of the muscles are usually noticed fairly early, and may at first be confined to one particular part of the body, but later become general and are symmetrical. Pain is not a constant feature, but may be present early in the form of sharp shooting pains in the extremities. At first the reflexes are normal, but later tend to become exaggerated. During sleep the choreic movements usually disappear and can frequently be controlled in the earlier stages on voluntary movement. In the later stages there is progressive muscular weakness, with some wasting of muscles, but no alteration in the electrical reactions or loss of sphincter control.

The mental state of the patient gradually deteriorates, and this is occasionally the first manifestation of the disease. The form of mental incapacitation varies: some are moderately

others may become violent, injuring themselves or others; minor delusions are fairly general, but by far the most common state is progressive deterioration, with a flattening out of all mental faculties. These symptoms however are not always all present in the one patient and not infrequently there may be very little mental impairment, while in others the mental picture predominates and very few physical symptoms are noted.

Diagnosis.—Little difficulty is encountered after the patient has been observed and a careful family history obtained. Without a satisfactory history, however, the disease sometimes cannot be definitely distinguished from other forms of progressive chorea and senile chorea.

Prognosis and treatment.—The prognosis is absolutely hopeless, and although many drugs have been tried nothing has been found to retard or inhibit the progressive course of the disease. Palliative drugs are useful only to induce sleep and make the patient comfortable when necessary.

Since it has been established that the disease is definitely an hereditary one our only hope at present seems to be extermination of the strain. The difficulty here, of course, is the fact that the disease seldom manifests itself until late in the reproductive life of the individual, and there is no way of telling in persons with such an hereditary background whether they will develop the disease or not until symptoms first manifest themselves. However, a glimpse at the family tree in this case, and a study of many more complete ones will serve to convince us that if we hope to eradicate this dread disease the indications at present are along the lines of sterilization.

CONCLUSIONS

I am reporting this case not because it is a rare or an atypical one but because the history and the family tree illustrate the essential points of a definite disease. It is the one outstanding neurological disease in which we can construct a complete history with a definite physical and mental picture, general course and outcome, and in which the etiology, pathology and manner of transmission are also well defined. With all these definite factors it seems quite apparent that there is only one indication for treatment and that is elimination of that particular strain. From a scientific and humanitarian point of view it is self-evident that any person with a family history showing Huntington's chorea, or at least whose father or mother has suffered from this disease, has no right to have children. On the basis of the knowledge already in our possession, the eugenic standpoint is the only one the physician can properly adopt. Huntington stock should not reproduce.

In considering those who escape the disease we may safely say that if both parents are free from the disease their children will be free from it. However, due to the fact that some of the lineage frequently die from other causes before they have reached the age at which symptoms appear we can only be dogmatic in saying that the third generation with grandparents and parents free of the disease will be assuredly free. These relations are clearly indicated in the accompanying chart, which is quite typical.

Huntington's chorea is a disease which can be eradicated; but only by stopping it at the source. With the knowledge at hand the obligation of the profession is unmistakable.

SUCCESSFUL REMOVAL OF AN ENTIRE LUNG FOR CARCINOMA OF THE BRONCHUS.—E. A. Graham and J. J. Singer report a case in which the left lung and many of the tracheobronchial mediastinal glands were removed in a one stage operation because of a carcinoma that originated in the bronchus of the upper lobe, but which was so close to the bronchus of the lower lobe that, in order to remove it completely, it was necessary to remove the entire lung. The examination of the lung after its removal showed no evidence of any extension of the carcinoma beyond the original site. The whole tumour measured only about 1 cm. in the long diameter, but it was situated almost at the bifurcation of the main bronchus into the bronchus of the upper lobe and that of the lower lobe. The nodules, which had been felt in the lung at operation, were small abscesses that showed no evidence of carcinoma on microscopic examination. Likewise, the enlarged tracheobronchial glands, which had been removed from the mediastinum, showed no evidence of carcinoma. The tumour itself was definitely

a squamous cell carcinoma. It had not invaded the bronchial cartilage. By analogy with what is well known concerning carcinoma of the larynx, the failure of the tumour to invade the bronchial cartilage in this case would seem to be of excellent prognostic significance. Despite the fact that the hilus of the entire lung was suddenly shut off by a tight ligature, none of the signs or symptoms of pulmonary embolism appeared. The sudden obstruction of the pulmonary artery of the left lung by the ligature was analogous to the sudden obstruction of it by an embolus. Nevertheless, not the slightest change in the character of the patient's respiration could be noted immediately following the application of the ligature. Possibly the fact that he was receiving intratracheal anaesthesia was of importance. A letter from the patient written four and a half months after the operation states that his weight has increased by 16 pounds since he left the hospital and that he is constantly gaining in strength and energy.—*J. Am. M. Ass.*, 1933, 101: 1371.

Case Reports

ACUTE NECROTIC PANCREATITIS WITH GASTRIC AND DUODENAL PERFORA- TION AND DEMONSTRATION OF THE LESSER PERITONEAL SAC WITH BARIUM

By H. H. MURPHY, B.A., M.D.,

*Radiologist, Provincial Royal Jubilee Hospital,
Victoria, B.C.*

This patient, a Japanese, male, of education and culture, aged 71, was admitted to the Royal Jubilee Hospital, Victoria, B.C., on September 13, 1933, under the care of Dr. D. M. Baillie. The evening previous to his admission he had become suddenly and acutely ill after a good dinner, which he particularly enjoyed. His only complaints were cramp-like pains centring around the umbilicus and lower abdomen. Vomiting was almost continuous.

On admission the man was obviously acutely ill. Temperature 98.4°; pulse 70; respirations 20. The whole abdomen was soft. His bowels had not acted since the onset of acute symptoms. The general physical examination was otherwise negative. The only significant points in his personal history were malaria many years previously, without serious recurrence; slight hæmaturia on several occasions; and a mild intermit-

tent glycosuria, which, over many years, had seemed to him of minor importance. Without laboratory aids, the working clinical diagnosis seemed to lie between a partial intestinal obstruction and a protected perforation of the gastrointestinal tract.

A urinalysis showed albumin, a heavy trace of sugar, and a few red blood cells. The blood sugar was 235 mg. per 100 c.c. of blood (normal 80-120). The white cell count was 9,100 per c.c., with the following differential: polymorphonuclears 81 per cent; small lymphocytes 15 per cent; mononuclear leucocytes 2 per cent; transitionals 2 per cent.

A radiographic examination of the abdomen showed marked gaseous distension of both small and large bowel. In view of the clinical and laboratory findings, this was interpreted in terms of a paralytic ileus. This was subsequently proved to be correct by the prompt bowel response to insulin and enemata. The diagnosis was now pancreatitis. After the use of insulin his more acute symptoms subsided slightly, but at no time during his illness was he free from gastric flatulence, indefinite abdominal pain and nausea. His blood sugar never reached the confines of the normal and he grew progressively weaker.

On September 27th acute respiratory symptoms developed, and a radiogram of the chest showed a small collection of fluid which was



FIG. 1

FIG. 2

aspirated. Cultures from this fluid proved sterile. About this time, profuse and repeated attacks of perspiration were added to the clinical picture. On October 10th, a very offensive odour was noted about the patient and this was soon definitely associated with the gas eructated. A barium meal, given on October 10th, was of particular interest. The barium at once escaped from the stomach as shown in Fig. 1, and at the 24-hour observation, the lesser peritoneal sac was clearly outlined as shown in Fig. 2. As the patient's condition was now critical, many attempts were made to secure satisfactory blood donors before operation, but were unsuccessful. On October 14th the lesser sac was drained through the left loin by Dr. H. E. Ridewood. In spite of energetic treatment the patient died about twelve hours after the operation.

An autopsy was done the following day by Dr. James D. Balfour, pathologist at the hospital. His report, quoted in part, is as follows.

"Diffuse generalized purulent peritonitis with free purulent fluid in the abdomen and pelvis, with distension of the abdomen. Very extensive necrosis throughout the entire lesser sac with numerous particles of barium. Very extensive necrosis of the body and tail of the pancreas. Multiple small areas of fat-necrosis in the omentum.

"Marked discoloration of the entire mucous membrane of the stomach, with perforation in the posterior surface situated 6 cm. below the cardia, and a second perforation in the posterior surface situated 3 cm. above the pylorus. Two perforations in the wall of the duodenum situated close to the pylorus. Superficial scattered areas of necrosis in the mucous membrane of the oesophagus.

"Extensive arteriosclerosis . . . with arteriosclerotic kidneys . . . and cyst the size of a walnut in the upper pole of the right kidney. Hydrothorax, moderate left . . . with atelectasis of the left lower lobe . . ."

Dr. Balfour's conclusions were that the gastric and duodenal perforations were secondary to the acute necrotic pancreatitis.

From a clinical point of view, it is probable that the first perforation occurred about the time that the very offensive odour developed. From a radiological standpoint, the interest lies in the demonstration with barium of the lesser peritoneal sac during life and for this reason the case is reported.

A CASE OF CYSTINURIA

By SIDNEY J. S. PEIRCE, B.A., M.D.,

Brandon

Cases of cystinuria are relatively uncommon; only some 200 are reported so far in the literature. This, and the fact that the study of these cases may throw some light on the obscure field of sulphur metabolism, justify reporting every case that comes under observation.

Miss J.D., aged 28, Canadian, living at home on a farm, reported at the Bigelow Clinic, Brandon, Man., for examination on May 10, 1933.

Complaints.—Pain in the left kidney region extending down the left groin, sometimes, colicky and sharp, at other times dull; frequency of urination.

History of illness.—First attack was ten years ago. She stated that at that time she passed 200 to 300 stones. She had had similar attacks at intervals since, during which she had passed small stones. During the last year attacks have been more frequent.

Personal and family history.—No serious illness. She was a fairly large meat eater, and often took meat and potatoes three times a day. Her parents had no kidney trouble. There were seven in family, and one elder brother, aged 34, gave a history of passing stones.

Physical examination.—Practically negative, except for tenderness in kidney region. The urine showed a few blood cells and a moderate amount of pus. Blood count: hæmoglobin 80 per cent; red blood cells 3,340,000; white blood cells 15,500. The tuberculin and Wassermann tests were negative. Cystoscopic examination showed pus coming from both ureters. Differential functional tests showed 25 per cent of dye from the right kidney, and 20 per cent from the left. X-ray showed calculi in both kidneys.

Subsequent history.—After seven weeks' preliminary treatment for anæmia the left kidney was incised through a posterior incision, and the calculi shown in Fig. 1 removed. Recovery was prompt and uneventful. Since then patient has had no attacks, and apart from some discomfort on right side, no complaint. She still has pyuria, but no frequency. An x-ray on August 11, 1933, showed the left kidney clear, the right kidney shadow the same as before (Fig. 2).

The calculi removed were 239 in number; total weight 20 grams. The largest weighed 2.7

grams. Specific gravity of smaller calculi, (water 22.3° C.) = 1.603; of large calculus (water 22.6° C.) = 1.612. Specimens in the Bunsen flame burnt completely with a bluish flame and a peculiar sharp odour suggesting cyanide. They dissolved, except for a very slight flaky residue, completely in ammonia and hydrochloric acid, and solutions on evaporation

Estimation of sulphur gave as an average of three determinations 25.73 per cent S, as against the theoretical amount of 26.52 per cent for pure cystin. These calculi, therefore, appear to be practically pure cystin. They are opaque to the x-ray as shown by the skiagrams of the kidneys and by experimental pictures taken after removal.



Fig. 1

Fig. 2

deposited the hexagonal plates characteristic of cystin. The solution of the calculi in hydrochloric acid, treated with sodium sulphite, caustic soda, and sodium nitro-prusside, gave a brilliant but evanescent violet colour, which rapidly changed to red, and finally to yellow. This is a well-known characteristic reaction for cystin. The time-factor of this reaction challenges in-

A striking factor observed in this case is that neither before nor after operation were cystin crystals observed in the urine, nor was it found possible by acidifying with acetic acid and long standing to demonstrate them. That the neutral sulphur was high, however, was shown by repeated examinations. Attempts to demonstrate diamines were negative.

TABLE

Date	Amount 24 hours	Total Nitrogen	Inorganic SO ₃	Ethereal SO ₃	Neutral SO ₃	Total SO ₃	Ratio Neutral to Total SO ₃	Remarks
	c.c.	grams	grams	grams	grams	grams	Per cent	
July 27, 1933	930	5.31	1.218	0.068	0.155	1.441	10.7	Normal control.
" 28 "	1830		0.733	0.107	0.415	1.255	33.0	Patient on low protein diet.
Aug. 9 "	2350	5.07	0.703	0.059	0.433	1.195	36.2	Patient on low protein diet.
" 14 "	3105	7.65	1.338	0.090	0.592	2.020	29.3	Diet increased by 3 oz. meat, 3 eggs daily.
" 21 "	1900	5.78	1.365	0.108	0.602	2.075	29.0	Same diet.
Oct. 2 "	1535	5.71	1.248	0.065	0.624	1.937	32.3	No restriction in diet.
" 10 "	1700	8.95	2.082	0.134	1.350	3.566	39.1	High protein diet.
Dec. 8 "	1780	6.18	1.133	0.082	0.577	1.792	32.2	No restriction in diet.

vestigation. It is found that the speed is directly proportional to the alkalinity, and, with some correction, to the logarithm of the temperature, and bears an inverse ratio to the concentration of the cystin. This feature is being further investigated with the object of determining whether the time factor may be used in estimating cystine quantitatively.

The Table shows the results of metabolic studies in this case. It is seen that the neutral sulphur was constantly high and rises with increase in protein intake.

The interesting features in this case are: (a) the absence of cystin crystals in the urine in the presence of pure cystin calculi, and at the same time a constantly high proportion of

neutral sulphur; (b) a possible hereditary factor, the numerical relation being that of a Mendelian recessive; (c) the intensity of the x-ray shadow thrown by a pure cystin calculus.

AN UNUSUAL FRACTURE OF THE UPPER END OF THE TIBIA*

By F. S. DORRANCE, M.M., M.D., C.M.,
Farnham, Que.

On August 4, 1932, I was called to the home of Mr. R.C., aged 36 years, whom I found to be suffering from an injury to the right knee received one hour previously. The history of the injury is best described in the patient's own words. "I was practising football. After placing the ball for a goal kick, I took two or three steps forward and drove the ball with the toe of my right shoe, using a hard 'snap kick' from the knee. As I kicked the ball an intense stabbing pain shot down from the back of the knee to the heel. The pain was so severe that I fell forward on my hands. I could not get to my feet and was carried home."

Physical examination.—When first seen the patient was lying on his back with the right leg in extension, a small pillow supporting the knee posteriorly. The knee was swollen and the patient stated that the swelling was increasing. His general expression was one of "questioning helplessness". He complained particularly of dull pain in the region of the knee posteriorly. The knee was markedly swollen but not very tense. There was a distinct transverse depression just above the upper limits of the suprapatellar pouch. There was slight general tenderness over the entire joint, most marked in the popliteal space. The patient could not voluntarily move the knee. Passive movements at the hip joint could be carried out, but movements of the ankle were productive of spasm in the muscles of the calf.

Personal history.—His previous health had always been good. He had had one other accident, twelve years previously, in which he received fractures of the metatarsal bones of both feet, since which time he had worn arch supports for comfort.

Treatment.—The patient was given a hypodermic injection of $\frac{1}{4}$ gr. of morphia. A thick layer of absorbent cotton was applied around

the knee, extending beyond the swollen area; this was held in place by an elastic bandage. An ice-bag was applied, which gave considerable relief. The knee-joint was aspirated on August 5th, 6th, and 7th, and 75, 65 and 30 cubic centimetres, respectively, of bright red blood were removed. Bandaging and ice-bags were continued.

On August 8th the swelling was considerably less, and he was brought to my office for x-ray examination. The injury was found to be a splitting-off of a considerable portion of the head of the tibia, including the origin of the tibial spines as seen in Figs. 1 and 2. Dr.

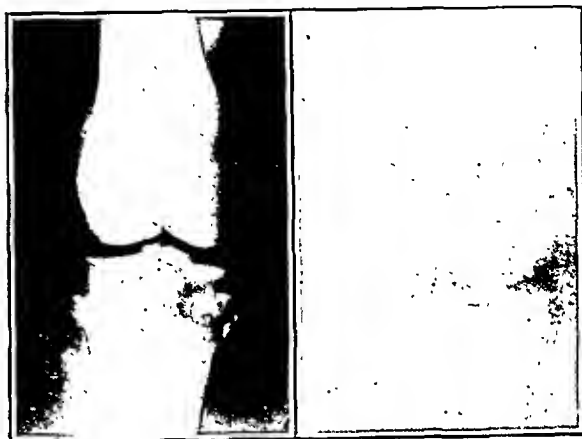


FIG. 1

FIG. 2

Ritchie's report on these plates is as follows. "From a study of the plates there is evidence of a transverse fracture through the anterior and internal portions of the head of the tibia, approximately $\frac{1}{4}$ of an inch from the articular surface. The line of fracture runs up into the joint, and passes through the base of the anterior spine with no displacement."

The diagnosis being established, the condition was explained to the patient, together with the functional disability which might result. The bandaging was continued. He was instructed to spend his days in a rocking-chair, with the foot of the injured leg in a higher "hard" chair, to rock to the point where pain in the knee became noticeable, and to stop rocking when he became tired; to walk with crutches; to restrict his fluid intake; and to take sufficient Epsom salts to insure two bowel movements daily.

August 15th.—He complained of slight pain in the knee-joint before going to sleep at night. August 19th.—Massage was commenced on the quadriceps femoris. August 26th.—The bandaging was removed from the knee-joint. September 1st.—He was able to bear his weight on

* Presented at the Montreal Medico-Chirurgical Society Meeting, February 2, 1934.

the right knee. September 12th.—He could walk short distances without pain. September 21st.—Slight anterior displacement of the right tibia was possible on passive movement and was noticed occasionally on active movement. September 29th.—He began to work as a gardener from 8 a.m. to 6 p.m., although I advised him to wait for three months from the date of accident.

He was x-rayed on January 27, 1933. This showed "apparently complete union, with the fragments in excellent position and no evidence of any arthritis." He walked with a slight limp because of his desire to maintain the right knee without full flexion.

He was thoroughly examined one year after the accident. He said he was unable to tell which leg was injured, except for a slight tightening of the flexor muscles of the knee after walking a distance of more than seven miles in one day. His knee was perfectly stable; flexion and extension were fully and freely performed. There was no pain when he made a jump to the ground from a distance of three feet.

This case is reported because of the unusual nature of the bone lesion, without crucial ligament injury, and because of the excellent result obtained by active motion and early use.

I am greatly indebted to Dr. Ritchie, of the X-Ray Department of the Montreal General Hospital, for the making of the prints and for his kindly cooperation.

A CASE OF ATRESIA OF THE ŒSOPHAGUS IN THE NEW BORN

BY W. LEONARD, M.D.,

Trail-Rossland Clinic,

Trail, B.C.

The patient, a male, was born on November 5, 1933, at 4.35 a.m. While the child was still on the delivery table it was noticed that mucus was excessive, despite repeated stripping of the throat and nares. Its colour was good. No external abnormalities were noticed.

The first feedings of lactose, 5 per cent, were taken very poorly, nearly all being regurgitated. Mucus continued to be troublesome and the child was cyanosed at times. Gavage was attempted, but the catheter would not pass beyond 8 cm. from the lips. An x-ray was taken with the catheter in position, and the film showed this to be arrested at the level of the 4th rib, thus

confirming the diagnosis of atresia of the œsophagus. On the second day a small amount of bile-stained fluid was vomited. Meconium was passed normally, and later small amounts of normal stool. Aspiration pneumonia developed and the child died on November 9th at 5.30 p.m.

Maternal history.—The mother was in good health. She had had two previous pregnancies, both normal. The present pregnancy had been uneventful. Labour was normal throughout.

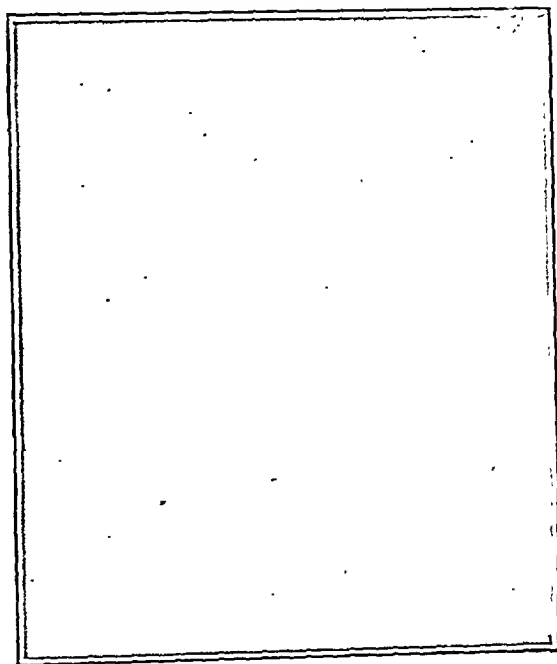


FIG. 1

Post-mortem examination.—The thoracic organs were removed from stomach to larynx. On opening the œsophagus from above, the lumen was found to be enlarged and ended blindly at a point 5 cm. above the lower end. Below this point it was completely occluded for a distance of 15 m.m. then became patent and continued so with a diameter of 1 cm. to the cardiac orifice. At a point 4 m.m. above the bifurcation of the trachea there was a communication, which admitted a medium-sized probe, leading to the lower œsophageal segment and opening just below the lower end of the obliterated section. The lungs showed bronchopneumonia. The other abdominal and thoracic organs were normal.

Kaufmann¹ describes this condition in his textbook. He states that it is the most typical of œsophageal abnormalities, but no reference is made to the frequency of occurrence.

REFERENCE

1. KAUFMANN'S PATHOLOGY, 12, BY EDWARD KAUFMANN. Pp. 1-2 1929, 1: 651.

Editorial

THE PRESIDENT'S ADDRESS

ELSEWHERE in this issue will be found the President's address; delivered at the sixty-fifth Annual Meeting of our Association held at Calgary. There are presidential addresses and presidential addresses—some good, some bad, some merely indifferent; some laboured, some perfunctory—but all those who have had the good, or bad, fortune, to be compelled to prepare a presidential address will agree that their's was no light task, one from which they would willingly have shrunk. Their audiences, also, will agree that in many cases the presidential address might well have been "taken as read". Not so with Dr. McEachern's. His address does much more than retail the past; it presents a vision of the future. For this we thank him. His address, too, is the more noteworthy in that it was composed under the disability of recent illness, but, yet, has the hall-mark of that practical sense and constructive vision that are so eminently his characteristics. We rejoice in the indications of renewed vigour that he showed at the meeting.

Doctor McEachern harks back to the birth of our Association and the straitened days through which it passed. He refers to the memorable time, some thirteen years ago, now, when it seemed likely to die of inanition. He recounts some of the steps that were taken then to ensure its survival. In his modesty he does not tell us, however, that if our Association is in existence to-day it is because of the faith and prevision of one man, more than any other, and that man, Dr. J. S. McEachern. But such is the fact. It is entirely in the fitness of things that the highest honour which can be conferred by the institution which he helped to save has come in course of time to Doctor McEachern.

Doctor McEachern recounts the more important of the many activities of the Canadian Medical Association, and traces its growth from an impotent to a powerful and representative national body. We some-

times hear the question—"But what can I get out of the Association?" Anyone looking for an answer to that question, can find it, we think, in the President's address. We submit that there is good reason for every member of the medical profession to belong to the Canadian Medical Association. It is not only a duty but a privilege. Put on the lowest possible score—it pays.

Doctor McEachern points an unerring finger at what is the most important single problem before the medical profession today—the training of the medical practitioner and his fate after he is trained. His suggestion that the course of medical studies be reduced by one year, by the simple expedient of reducing the length of the vacation period, is eminently sensible. The lengthy summer vacation that is now permitted between the various academic years seems to us to be archaic. It is a relic of the days when it was thought necessary to allow the aspirant to medical honours time to acquire as he went along sufficient money to pay for his board and tuition. It may well be doubted whether it ever was fair to penalize the many, in time, money, and energy, for the benefit of the few, however deserving. Nowadays the course in medicine is hardly for the poor; it is a luxury for the rich; and, anyway, there are no summer jobs! A vacation period is, of course, necessary, unless we are willing to risk that our medical students break down in health, but two months is long enough.

Doctor McEachern, again, refers to the existing plethora of medical men, but does not offer any solution of the difficulty. One would think that, considering the length, the difficulty, and the expense of the medical course, together with the, in general, inadequate remuneration of medical service, and the uncertain future, a medical career would present few attractions to the young man, but the reverse seems to be the case. As a matter of fact the various medical colleges of Canada are attempting to cope

with the problem by restricting their intake. The matter is not entirely simple, however, for conditions vary in the different parts of Canada so that there can be no fixed rule for universal application; in some parts the racial question is the more prominent; in others, that of the alien. All this, too, is apart from the basal requirement of broad general culture and special scientific training. In the West, where there are a considerable number of racial groups, it would seem desirable to limit the output of medical graduates who are members of these groups to the number necessary to properly care for the health requirements of their compatriots. To graduate more than these is manifestly unfair to the rest of the medical population. In the East another situation exists—the influx of medical students from non-British countries. These particular students are often well-trained, and, from the standpoint of scholarship and general preparation, are desirable acquisitions. Further, they usually take kindly to our Canadian institutions, and, we may presume, will exemplify our viewpoints later in their own countries. They tend also to break down prejudices, which is a good thing. Still, if any number of these, when qualified, settle down to practice in our country an injustice is done to our own young men, who may have been rejected to make room for them, and to those who are already established in practice. Much circumspection is required in the premises.

Doctor McEachern brings up the important matter of unification of examinations for the purpose of qualifying medical graduates. At the present time there is a fairly simple system in force in certain of the provinces, among them, for example, Quebec and Nova Scotia, whereby the course and final degree examinations are conducted jointly by the university authorities and assessors appointed by the provincial licensing boards. Under this system those who desire the license to practice of these particular provinces and are properly registered receive their medical degrees in due course and *ipso facto* their licenses. It is highly desirable that the same or a similar plan be applied in the case of those desiring the diploma of the Medical Council of Canada.

Probably there are charter or legal difficulties in the way, but, surely, these are not insuperable. Let us, as soon as possible, relieve the hard-worked medical student of an additional and unnecessary burden. The Canadian Medical Association might well press this matter.

The future of the medical profession is in the lap of the gods. A socialistic form of medical service, a state medical service, some form of health and sick benefit insurance of nation-wide scope, a more limited, scattered type of group insurance, the application of the group system of practice to the medical practitioners themselves, or a disjointed, haphazard way of dealing with local conditions—which or what shall it be? In this connection we would call attention to the report of the Economics Committee, of which Dr. Harvey Smith, of Winnipeg, is chairman, and Dr. Grant Fleming, of Montreal, secretary, which was submitted to Council at the Calgary meeting. Without doubt, this is the most important document of the kind ever submitted to our Association. It is lengthy, but that is because it is complete. Not only are the systems of health insurance in vogue in European countries put clearly and succinctly before us, but our own position in Canada is set forth and constructive ideas are furnished us. This report is a model of its kind and should be read by every medical man in Canada, whether a member of our Association or not. Issues vital for the profession are at stake here. We must agree on what we ought to do and then see to it that our views are put forward authoritatively and effectively. Certainly, we should not allow federal, provincial, or municipal authorities to initiate advanced legislation involving the conditions of the practice of medicine without demanding that we be consulted. And time is pressing.

Finally, we can all endorse Doctor McEachern's remarks relative to the co-ordination and correlation of the health work of our country, both in regard to man and the domestic animals. More unification and more central direction of effort would seem desirable. Doctor McEachern deserves our thanks for bringing these weighty matters so effectively to our notice. Let us act.

ALAN.

THE SIXTY-FIFTH ANNUAL MEETING

OUR Sixty-fifth Annual Meeting has passed into history. Our Association had not met in Alberta for twenty-two years prior to the recent assemblage in Calgary. The previous meeting was held in Edmonton. Great developments in the Association and in these rival Alberta cities have taken place during the interval. Many of our members who attended the Edmonton meeting in 1912 have "passed on", and some few are surviving "to reminisce" and make comparisons. The registration in Calgary was between five and six hundred, a gratifying figure.

The foremost editorial duty and privilege is to intimate in no uncertain terms the widely-expressed gratification of the visitors at the excellent organization of the Calgary profession, which made both the scientific and social programs so interesting. The Palliser Hotel afforded a very attractive setting for the meetings, as well as luxurious comfort for the visiting guests. The activities were concentrated in such manner as to make it possible to follow many of them with a minimum of stress. A few of the members had a fair quota of sleep and most of them had sufficient recreation to stimulate the digestion of scientific pabulum.

During the first two days the Council was conscientiously employed in the consideration of some most important topics under the able chairmanship of Dr. George Young.

On the morning of Wednesday, June 20th, the scientific sections opened up promptly. The medical and surgical divisions were soon booming with artillery, and the "brass-hats" were much in evidence along the firing-line. At luncheon Mayor Davidson gave an address of welcome which was greatly appreciated for its understanding of the medical profession—at the instance of a dynamic layman like His Worship.

The afternoon session was followed by a Tea given by the President and Mrs. McEachern in the spacious garden of Senator Patrick Burns. The weather was carefully selected to demonstrate the underlying truth of the proverbial epithet "sunny Alberta".

In the evening the Association Dinner and

Dance took place. To an audience which almost overtaxed the huge dining-room of the Palliser, an address of welcome was given by Lieutenant-Governor Walsh and immediately afterwards he presented, on behalf of Premier Bennett, three large bouquets of roses, one to Mrs. Lindsay, one to Mrs. McKidd, and one to Mrs. Park, widows of three pioneer physicians of Alberta. Through the courtesy of Mr. Bennett, also, corsage bouquets were presented to every lady present. The Prime Minister, it was expected, would have attended this function in person, but owing to parliamentary obligations he was prevented from doing so.

The ball room was a brilliant terpsichorean scene until one o'clock, the music deserving special mention.

On Thursday morning the scientific program included important contributions from prominent physicians and surgeons. Specially interesting items were provided by the Ear, Nose and Throat Section, as well as the Radiological Section. A most interesting feature was a meeting of a Section devoted to Historical Medicine. For the military members a memorable luncheon was provided by Lieut.-Col. J. N. Gunn, D.S.O., of Calgary. A very able paper was presented after luncheon by Major F. C. Clarke, M.C., outlining the scope of the Army Medical Corps in future wars. Col. J. T. Clarke, formerly D.G.M.S., and inaugurator of our Military Section, gave an outline of the work of the St. John Ambulance Association in its relation to the profession of medicine and the Army Medical Corps. On Thursday afternoon a symposium on cancer held the interest. Later the guests were entertained by Major McPhedran at a garden party in the grounds of the Central Alberta Sanitarium.

On Thursday evening the Blackader Lecture, a triennial event, was given before an open meeting by Dr. James Craigie, of the Connaught Laboratories. A highly technical subject was presented in a form interesting to all and everyone felt that Dr. Craigie is an unrivalled master of the intricacies of virus infections. On Friday,

the last day of the session, the scientific program was so intriguing that one desired a dual or triad personality to attend all the attractive features. Two noteworthy presentations were those of Dr. C. A. Baragar on "Sexual Sterilization in Alberta", and of Dr. J. B. Collip on "The Development of our Knowledge of the Pituitary Gland and the Antihormone Theory". Special reference is due to the masterly review of the cancer situation presented by an American guest, Dr. Max Cutler, of Chicago. The urological section under the chairmanship of Dr. Emerson Smith, of Edmonton, was also the centre of much interest.

A very comprehensive symposium on cardio-vascular disease was the feature of the Friday afternoon general session, presented in a convincing manner by Drs. Duncan Graham, John Oille, C. C. Birchard and John Hepburn. Following the last session there was a stampede at the Sarcee Indian Reserve. The focussing point of this gathering was the tug of war between four thin Indians and four fat medicine men, in which the red men proved themselves to be stronger than the pale faces.

The special exhibits drew a great deal of attention during the available intervals of the week. An elaborate collection of historical data and photographs were given a special room under the patronage of Dr. Heber Jamieson, of Edmonton, whose unremitting perseverance in the assembling of traditions and personalities in Alberta medicine is deserving of the highest commendation. Dr. J. J. Ower, Professor of Pathology in the University of Alberta, had a particularly praiseworthy collection of mounted specimens, including a series of brain tumours.

On the main floor of the hotel a radiological exhibit included a remarkable series of duodenal ulcers by Dr. Bernard Mooney, of Edmonton, and another of bone tumours by Dr. Richard Procter, of the University of Alberta Hospital. Another excellent exhibit

from Edmonton was that of Dr. Geo. Malcolmson. It is impossible to give details of this important part of the meeting in a summary like this, but it is greatly to the credit of the radiologists that they sent forward their exhibits from coast to coast. Great interest was shown in those of Doctors Kirkland, of Saint John, N.B.; Friedman, of Montreal; the Mowbray Clinic, of Hamilton; Macmillan, of Winnipeg; Cuddy, of Winnipeg; Shepley, of Saskatoon; Henry, of Regina; Prowd, of Vancouver, and Murphy, of Victoria. The Saskatchewan Cancer Commission gave an interesting series on the early diagnosis of cancer which was of particular interest and educational value for the laity.

Prominent figures among the guests other than those mentioned were Dr. Alexander Primrose, whose guidance is always sought in administrative problems and whose interest in the Association never wanes; Sir Frederick Banting, our worthy knight of insulin; and our old friend, Dr. R. W. Powell, whom everyone was delighted to see so hale and hearty again. We missed the genial presence of Dr. Alfred Bazin, whom we hope to see with us next year.

Comings and goings of environmental interest were provided by the Calgarians for those interested, in the Prince's Ranch and the Turner Valley. A charming luncheon given by Mrs. McEachern for the Councilors' wives on Monday, and a delightful tea given these ladies by Mrs. McKidd on Tuesday were very much appreciated. A special vote of thanks is due to the ladies of Calgary, in general, and to the Calgary doctors' wives, in particular, for a series of joyful and varied entertainment given to the wives of those visiting members who had the good judgment to be accompanied by their better halves.

Came Saturday. And so to Banff. Thank you, Calgary!

EGERTON L. POPE.

Editorial Comments

Foreign Bodies in the Air Passages .

The taking of x-rays is admittedly a very highly specialized technique, and a specialization which completely justifies itself. It is one, however, that has further degrees of specialization. This is quite apparent from a volume* which has been most recently added to the annals of roentgenology. It is a collection of x-rays of foreign bodies in the air and food passages, but it is more than a mere collection of illustrations, for it is accompanied by clinical data which at once attract the general attention.

The roentgenologist has two questions before him in this type of case: (a) Is there a foreign body present? (b) If present, where is it? It is because the answering of these questions is difficult in some cases, and even impossible in a small but important proportion, that the refinement of specialization in technique referred to becomes necessary. A roentgenologist may quite easily have the mortification of being confronted with a foreign body which he had reported as not being present. This leads to one of the axioms laid down in this book that a negative report as to foreign body should always be qualified by the statement that although there are no x-ray signs of foreign body at the moment such signs may change or even disappear for a time, and a further examination should be carried out if the symptoms persist. On the other hand, there are a great many canals, spaces, and organs in which a foreign body may be lodged, all the way from the nasal passages to the rectum, and this calls forth another axiom, namely, that x-ray examinations should include head, neck and trunk from the roof of the nasal chambers to the tuberosities of the ischia; and, yet further, that the finding of a foreign body in one region is no proof at all that there are no others somewhere else. In illustration of this latter the x-rays of a child are shown who had not only a cluster of safety pins in its hypopharynx but also an odd needle (for good measure!) in its intestine. The first was removed, the second perforated the gut, but because it had been recognized beforehand no time was lost in doing the necessary laparotomy.

The radiopacity of an object is of course the key to its detection by x-ray. It must be remembered however that foreign bodies may be quite radioparent when first swallowed or inspired, witness the case of a chicken bone in a woman's left lower bronchus with absolutely no x-ray signs or of such slight opacity as to be indistinguishable from adjacent shadows; or

inflammatory changes may be produced that mask the foreign body shadow, the last being especially true of bones and teeth. Then too a radioparent foreign body in the trachea may affect the aeration of both lungs equally and thus lead to an erroneous report. So small a detail as the position in which the x-ray is taken may be of the greatest importance. One case is quoted in which an antero-posterior picture showed a pin lying apparently in the stomach but on opening the abdomen no pin could be found. Another x-ray, this time in the lateral position, showed the pin to be actually in the costo-phrenic angle, when it was duly removed. There are several reasons why a lateral picture may be necessary; young children, for example, may be x-rayed in the lateral position better than in the antero-posterior; a foreign body shadow may easily be swallowed up in that of some dense anatomical structure when looked up in one position and yet stand out clearly when viewed in another; long objects such as needles look very small end-on and may even be missed in a plate taken in only one direction, besides which the endoscopist likes to know all he can about the shape and size of his foreign body. One startling case is recorded wherein a patient for œsophagoscopy showed by lateral films only a dislocation of the first and second segments of the cervical spine which would have rendered the examination fatal.

These are a few of the points which must be kept in mind by the roentgenologist in taking his pictures but there are other pitfalls which he must also avoid and these are specially referred to in regard to negative reports. A fluoroscopic examination should never be taken as final evidence of the absence of a foreign body, even metallic objects being sometimes unrecognized on the screen and yet visible on the plate. Again, under certain conditions, even a metallic foreign body may be of low visibility, such conditions being movements, transmitted or otherwise, slenderness of form, overlying shadows, or a combination of all these.

These are a few of the points which such a compilation as these brings to our mind. It is well to have the importance and difficulty of x-ray examinations thus emphasized. H.E.M.

Sir Frederick Banting, K.B.E.

We extend to Sir Frederick Banting our very warmest, if somewhat belated, congratulations on his knighthood. Sir Frederick has always had ample proof of the high esteem and honour in which he is held, not only by his own people but by all civilized nations; that he should now be included amongst those whom it delighteth the King to honour is peculiarly gratifying. H.E.M.

* Foreign Body in Air and Food Passages, Chevalier Jackson, M.D., Sc.C., LL.D., F.A.C.S., and Chevalier L. Jackson, M.D., M.Sc.(Med.), F.A.C.S. 265 pages, illustrated. Price \$12.00. Paul B. Hoeber, New York, 1934.

Dr. C. F. Martin, LL.D. (Harvard)

We note with very great pleasure the conferring of the honorary degree of Doctor of Laws on Dr. Charles F. Martin at the Harvard Uni-

versity's twenty-ninth commencement exercises. We add our congratulations to the many that he must have received on this recognition of his distinguished career. H.F.M.

Special Articles

THE PATIENT AS A PERSON*

By A. H. GORDON,

Montreal

As we approach the time of life when the "lamp of our youth is utterly out and we subsist on the smell of it", one may be permitted to indulge in occasional reflections upon things in general, or in other words to engage in the pastime of thinking that he is thinking, and it is in such a frame of mind that I would ask the forbearance of a group of serious-minded students of medicine, seriously bent upon the advancement of their art, as they give up a quarter of an hour or more to the subject named upon the program as "The Patient as a Person". The title itself is trite to the point of banality, for what else could a patient be but a person? The answer is that in the progress of our art the *case* of illness may by almost imperceptible stages pass from being a *person*, through the stage of being a *problem*, and end in being regarded as so much *material*.

In the pursuit of pure science absolute accuracy is our goal, and a large part of science consists in *measurement*, and measurements of form, size, colour, density, length, breadth, strength, are the processes which occupy much of our time and energy in the pre-medical and primary medical years of our apprenticeship. Normals are established, and from these judgments are formed, and in the attempt to bridge the gap between pure science and its practical application in clinical medicine and surgery we presume to establish normals for man and for his various systems, and by the methods of clinical medicine we attempt to recognize the deviations from these normals. We recognize sensations of heat and cold, colour, sound and tension through our special senses, and assemble the results and adjudicate upon them. To these are then added other impressions through the special senses, conveyed by instruments of precision, and all of these together constitute our foundation in fact.

The *art of medicine* thus is founded upon the facts ascertained by physiology, chemistry and physics, and a clinical training equips us to employ these facts and translate them into methods as simple as may be, with instruments as few and as portable as will answer the purpose of placing the examination of sick people upon a

sound, scientific basis, without pretending to reach absolute accuracy in any individual instance. After all the facts are gathered there is one other means by which these facts are brought together and synchronized. This has been known from time immemorial as "medical instinct" or "medical intuition", but, to paraphrase Thomas Carlyle, who spoke of genius as an infinite capacity for taking pains, this intuition is nothing more than an infinite capacity for accurate observation.

Just touching the high spots, I have attempted to draw a sketch of the methods which one employs to seek out the end of the thread in the tangled skein of disease, and as one in the search for this elusive end examines the various bodily systems, the respiratory, circulatory, digestive, etc., there is one other aspect of the human that he must not overlook, and that has been described in rather graphic words by White as the "Crystallization of Thought Patterns".

What a man or woman is today is, among other things, the sum of what he has been thinking in the years or decades gone by, and these are the things that have given him shape as a "person". When a spermatozoon meets an ovum a process commences which has greater power for the good or ill of the world than when Vesuvius explodes or the Nile overflows. Such events projected into the world its Caesar and its Napoleon and its Shakespeare, each a *person* by grace of no king or president, but by an inheritance reaching back to the dawn of time; and while the rest of us may be but pigmies in comparison with these whom I have mentioned, the fact of being "persons" makes us units in the history of the ages, and endows the poorest thing of a man with a value which may rightly demand from every other man that he respect the sign "No trespassing".

In law I understand that a "person" is a man or corporation subject to certain rights or duties, and for this reason women, up to the present, have not been admitted to the practice of the law in this Province, for women are not considered to be "persons". It goes without saying that the legislators who made this decision did not carry the discussion back to their own firesides, or there would have been an epidemic of by-elections in their various constituencies.

A man once said to me that honesty does not become automatic in an employee of a business until he learned to look on money as a commodity, like potatoes or coal.—until it became

*An address delivered before the McGill Medical Society.

only so much material with which to do business; for then it lost its power to tempt him, and, technically, the ideal method of dealing with the ailments of human beings should be the reduction of these units to terms of chemistry and biology, when one could deal with them untrammelled by sentiment or compassion. If our premises were correct, these conclusions might also be well founded, and we could deal with each patient as so much medical, surgical or pathological material, and his life-history, after he reached our hands, might be modelled after that which made up the "Protocol XVI—male guinea pig, weight 750 grms.; both ureters tied on October 8th, etc., etc."

But, while technically it may be correct to say that all the phases of human life in sickness and health are biological phenomena, we recognize in ourselves and by analogy in others, disquieting lights and shadows which the biology of the laboratory or the chemistry of the test tube does not explain, and we firmly, if vaguely, realize that the person called "me" and the person called "you" has each about him an intangible boundary, or an aura, at which even biological investigation must hesitate before it enters.

If history teaches anything it is that there is nothing new under the sun, and this is as true of the history of medicine as of the history of peoples. The Founder of Christianity taught and healed people one by one, and the Church through the Dark Ages tended the ills of men because these men had souls to save, but later the Houses of God, or Hôtels-Dieu, where the sick had been cared for, became the seats of learning, and science sat in the chair of faith, and the sinner with his ills became the case with an illness; and, later still, medicine became a matter mostly of statistics and of morbid anatomy, and because the sick and the sad and the weak asked for bread and the doctors gave them stones, they turned to fetishes and incantations, and many got from Christian Science and Chiropractic *et hoc genus omne* the relief that scientific medicine did not give, because it grew so scientific that it leaned backward instead of downward. But a great change is coming over the medicine of the last few years, and the "person" has again come before the footlights where for years the "case" had held our attention. As leaders in this trek back to the "person", honour is due to the people of Harvard Medical School, perhaps first to Dr. Richard Cabot and Dean Edsall, and to the latter I am indebted not only for some ideas but for the words which express them.

But one may ask, why worry about the "person" of John Doe, when John's body, alive or dead, is carefully examined, his disease catalogued and the correct method of treatment given him according to the book? Chiefly, because John does not get the correct treatment if John, the person, is ignored and only Doe, the host of an infection, is dealt with. "Persons" have rights, as cities and countries and nations have rights, and among these are the rights to life, liberty and the pursuit of happiness, and in this con-

nection I well recall one of the pregnant sayings of one of McGill's quiet great men, the late Professor James Stewart, "The first aim of treatment is to prevent death". That, in a few words, is the patient's Magna Charta when as a "person" he is put into our hands, and that motto would sometimes prevent, on the one hand, a dramatic resort to surgery, or, on the other, a procrastination of a necessary procedure for our own convenience. In the matter of the liberty of the person, I am reminded that people voluntarily entrust to us the liberty of their persons when they submit to anaesthesia, and we are bound to see that even while dead to the world, that person's body is respected, and that, though unconscious, he or she can be guaranteed against indelicacy or levity misplaced. The pursuit of happiness by the patient can be only a passive one and his human contacts are largely with doctors and nurses, and it scarcely seems good enough when a patient was moved to say as his doctor left the house—"Well, I've had my half guinea's worth of gloom for today."

Besides his rights, the patient as a person has other claims upon our attention, and two of these are his fears and his hopes. Fear is rarely in proportion to its actual cause. How many of us recall the shapes in the dark which to our youthful minds were dogs or bears, but were in reality but shadows, and sick humans may see in the half-light of partial knowledge the spectre of cancer or paralysis formed from some innocent symptom. The importance of that symptom to him does not rest in what it *is*, but in what it *appears* to be. A child could just as readily go into a panic from a shadow which he *thought* was a bear, as from the real bear himself, and our conception of the importance of any matter must take its weight from the fact that "persons" have fears.

A fatty tumour on the chest wall does not disturb the mind of a doctor, but to the sensitive woman who fears it is a cancer of the breast it is no less than a tragedy, and the puffy eyelids which come from poring over books may mean little to the oculist, but to the medical student who thinks they mean that he has Bright's disease they mean a great deal.

Let us look at another angle of the matter. A Pott's fracture of the ankle is a common surgical event, unfortunate, but not tragic to the mind of the doctor, but if that Pott's fracture is in the ankle of a clerk in a store, it may lay him off for five weeks, which to him means that he may lose his job. That is bad, but if he has a family it is worse, and if his wife is ill, that is much worse. So a minor injury in a "person" who has a "person's" responsibilities may become a major calamity when looked at through that person's eyes.

Then there is the fear of the unknown. I have often wondered with what mental attitude I should face the fact of being in Prague or Moscow with rheumatic fever and without money, and not knowing the Czech or Russian language,

and being taken from a ward into a theatre, there to have my attitude, expression, colour and nutrition noted by a hundred cheerful and curious students, having my joints pressed to see if they were sore, and much time spent over my heart which all present seemed to consider very bad; to have heavy hands hammer my chest and cold hands push in my stomach—would the fear of what was to come next take hold of me, I wonder?

Even to the native-born there are fears inherent in a hospital. He confronts the new discipline, the many instruments, the numerous examinations, the basal metabolism machine, which suggests an anæsthetic, the x-ray room, which suggests Hades, the presence of strangers and the absence of friends. Is there not enough here to bring fear to the calmest? and, though a hospital now differs from one in Lister's day, there is still some truth in Henley's description:

"A tragic meanness seems so to environ
The corridors and stairs of stone and iron
Cold, naked, clean, half workhouse and half jail."

Again fears come, not from what things are but from what they appear to be.

There are some other fears which are often forgotten by us when we deal with cases, but are real to the "persons" who are inside the cases. Some words in our language have come to have with some people the significance of a death knell. "Cancer", "consumption", "pneumonia", "paralysis", "hemorrhage"—any one of these, or like words, dropped carelessly into the ears of a sick person may crash down the corridors of his mind with a noise like the crack of doom. The danger inherent in the words we use raises the point that sometimes what we intend as the truth and the whole truth becomes nothing like the truth. If I tell an elderly person with a few signs at the base of a lung that he has pneumonia, I am telling the pathological truth, but that person's understanding of the word "pneumonia" implies a grave and usually fatal disease, which is not the idea I have in mind, and I have thus needlessly burdened him with a fear which has no foundation.

Besides having his *fears*, the person whom we have as a patient has his *hopes*, and the quelling of fear and the raising of hope are so important in a doctor's work that I doubt if any other of his functions exceeds them in importance.

Only "persons" can hope. I presume all here hope to pass into the year 1934. I hope we all will. Then we hope to pass the corner around which prosperity dallies, then we hope for that position of honour which is our due; some hope soon to be busy and some hope that sometime they will not be so busy. Your patient hopes that he has not got a grave disease; then he hopes to improve, then to be well. If he can't get well he hopes he won't suffer, and he hopes his family will be provided for. It would be a bad day for you and a bad day for your patient if you or he stopped hoping. You may not

realize it but the most obscure patient in the public ward in the matter of hope is on your level. "Hath not a patient eyes? Hath not a patient hands, organs, dimensions, senses, affections, passions? Fed with the same food, hurt with the same weapons, subject to the same diseases, healed by the same means, warmed and cooled by the same winter and summer, as a doctor is." People who are ill are more open to suggestion than those who are well, and a gloomy visage, an air of uncertainty, or a grave prognosis staggers hope and removes a large factor in the will to get well. May I again refer to my teacher, Dr. James Stewart. Ever a man of few words, he had given a clinic upon heart diseases and on the blackboard were written in column all the ordinary drugs employed for the heart, and after rapidly commenting upon them he took the chalk and said, "but the greatest of these is"—and wrote in capitals—H-O-P-E.

One might get the idea from what has been said that the allaying of fear and the stimulating of hope were the end and not the means, and that they should be brought about by any means whatever. Far from it. Because we believe that the patient is a person and not only a laboratory problem it is more incumbent upon us to know all that can be known about him by all the means, chemical and physical, at our disposal, and we should leave no stone unturned in the extraction of his history and the careful examination of his body, for this, and only this, gives us a sound basis from which to allay his fears and advance his hopes, but our inquiry should not overlook that "crystallization of thought patterns" that makes him the person he is and makes him act as he does.

It takes time and patience to learn how to dissect, how to do chemical analysis, how to auscultate and to percuss, how to tie knots, and how to maintain an aseptic technique, and it also takes time and patience to learn the method of approach into the mind of another. It has been said that success in war depends on knowing what your enemy is thinking, and success in dealing with sickness equally depends on knowing what your patient is thinking, or whether he is thinking at all, and each patient is a person who cannot be duplicated exactly by any other person. There is no royal road to this knowledge, but patience, perseverance, and observation will carry us far along the two rails of honesty and kindness. There is one method which will certainly fail. We cannot enter the mind of another by burglary, and the method of the third degree or of mental burglary is not the means of access. An invitation to you as a friend is much more satisfactory than a visit as a police officer.

There are many rewards in the practice of medicine, some are material and some are not, but the greatest which will come to us will be the gratitude we receive because at some time somewhere, we have treated a patient as a person.

RES MEDICINÆ ET CIVITATIS*

BY EGERTON POPE, F.R.C.P.(LOND.),

Edmonton

A recent issue of a western American paper suggested that in hard times, such as these, after-luncheon speakers are after luncheons to speak after. When your Secretary invited me a month ago to address you on this occasion, he admonished me that I must choose a non-medical or pseudo-medical subject. This seemed to me something less than the proverbial Hobson's choice, "This or none", for it was my impression that non-medical subjects are mostly *pseudo*, and that pseudo-medical subjects are altogether *non*.

In keeping with the mandates of professors of oratory in all well conducted night schools and correspondence schools, I asked myself what message have I for my good old friends in the Manitoba Medical School on their fiftieth birthday? In the course of many years of observation, I have found that unless one has a message to render 'twere better far to keep one's seat and one's silence. Indeed there have been authentic instances in which such a course would have been preferable at all costs. In reviewing the various conventional subjects of mid-day, high-noon, post-prandial addresses, I was forced to the conclusion that almost without exception all of them have been worn thread-bare. For the past twenty or thirty years I have sat patiently and enduringly. I might even say, generously, listening to high-sounding sentences, well-rounded periods, and greatly diversified accents, fervently applied to five great world-texts, to wit, Vision, Leadership, Challenge, Service, and Thinking. I have heard and seen these great texts juggled into various combinations and permutations with a singular devotion to the quantitative rather than the qualitative aspects of these concepts. For example, a typical oratorical coup would be delivered, in essence, in some such manner as this:—

"Ladies and Gentlemen.—What the great world of today needs most is Vision. To attain that great desideratum, world vision, we must demand what is deplorably lacking in these times of stress, Leadership. Therefore, we issue forthwith to our Governmental bodies, and in no faltering or uncertain terms a Challenge—a challenge, ladies and gentlemen, that is in effect an imperative demand for Service, Service for all, Service for one, Service with a capital 'S', and Service written with all capitals. These are fundamentals that must be apparent even to the man in the street,

no matter how dumb he may be, who is capable of earnest, intelligent and constructive Thinking."

As a suitable peroration for every well constructed address, this has been accepted almost ubiquitously. Indeed I am free to admit that these great world-texts have become so popular and so conventional, that when a spell-binder gives vent to any or all of them within my ear-shot, I am seized with an hysterical impulse, amounting to panic, to rush headlong into the plaza and tear my hair, or dash recklessly into the nearest forest and knock my head against the trees. Therefore, I promise you that in the two or three succeeding hours, so generously accorded to me for this address, I shall avoid scrupulously any reference to these vague, chaotic, and befuddling shibboleths of modern life. *Au contraire*, I shall endeavour to vouchsafe to you a message that is entirely free of Vision, wholly devoid of Leadership, scrupulously guiltless of Challenge, utterly unmandatory of Service, and more or less destitute of Thinking.

The first and most important part of the message is a broadcast of good-will from the University of Alberta which I have the honour of representing here today. With our expression of good-will we couple our most hearty congratulations and felicitations in your attainment of fifty years of—I nearly said "Service"—fifty years of usefulness in the cause of medical education in western Canada. For myself, incidentally, I may say that it is with great pride that I claim fifteen of those years in personal alliance with this great school. I confess, too, with pride, that it was here, in this hospital,—and over there behind the beyond in the Manitoba Club—that I received the training and the discipline requisite for the first occupation of the first chair of medicine in the University of Alberta. It seems almost unbelievable that more than a decade has passed since you sped me on my way with your good wishes and a cigarette case. I confess now that when I left you I had many misgivings, but that I was largely sustained by the romance and adventure of creating traditions in medical education in the farthest-flung western medical frontier in our Empire.

The remaining portions of my message, like the five great world-texts, are somewhat chaotic. Already you have agreed with me that all post-prandial, if not *all* subjects of addresses, have been chewed to the bone. In spite of your admonition, however, it is my intention to dwell for a moment upon some phases of our profession that are growing in importance daily. Perhaps one of these phases can be illustrated best by comparing the practitioner of yesteryear with the practitioner of today. The latter is the self-same, self-sacrificing lover of humanity as his prototype.

* An address to the Medical Profession in Winnipeg on the Occasion of the Semi-centennial Celebration of the University of Manitoba Medical College.

Owing, however, to the advent of high "overhead", expensive equipment, delicately balanced gadgets, and regal conveyances—latterly taking the form of inverted bath-tubs—one finds that it is necessary to make several remunerative passes before one qualifies for the primitive rights of eating and sleeping (not to mention smoking, drinking and golfing). And bear in mind, if you please, that the rule holds good for 365 up to 366 days of the year. Hence, whatever vacation one timidly takes to reinvigorate a mind that is wearied and a body that is fatigued must add proportionately to that relentless and soul-consuming overhead. The general practitioner in my boyhood days had his work-shop in his house, drove an old-style beast of burden to visit the sick, and averaged from one-half to three-quarters of a dollar per unit of advice and responsibility. Today, the corresponding practitioner has an office overhead greater than his prototype's total income. His equipage represents a capital investment equal to that of his prototype's total estate. His scope of usefulness has quadrupled, and his coefficient of wear and tear, grief, and endurance has quintupled. But his pecuniary reward, reckoned *pro tanto*, *ipso facto*, and *viva voce*, amounts to about one-half or three-quarters of a dollar per coefficient. Even the consultant in the last analysis, imposed by an unscrupulous inspector of income-tax, averages a similar fraction of coinage when he computes his public against his private work. It would seem, then, that, taking ourselves by and large, no one of us today is much farther ahead, except in frills and furbelows, than our mutton-chop bewiskered prototypes of the "gay nineties" in the Victorian era. It would seem that our profession is as much a creature of the machine age as the altruistic manufacturers of shoes, hose, and scanties. In consequence, good doctoring has become the prerogative and the privilege of the wealthy and the poor. The good old reliable middle-priced man is out of luck as usual. One prolonged disability in his family sets him back so far that he cannot see his way out of the hole in a life time. Can we wonder then that there is a cry from Macedonia, or Alberta, or Kamshatka, for state medicine, health insurance, or what have you? Thus it would appear that we must accept one of these as inevitable or revert to the bewiskered form of practice. The latter can hardly be entertained, but the present predicament is a mighty argument for the type of medical education that develops an expert sensitization of tactile, visual, auditory, olfactory, gustatory and sixth senses to offset the ever-growing and overwhelming reliance upon high-powered and extremely expensive diagnostic and therapeutic gadgets.

Thus we come to the next important topic,

the controversy between centralization and decentralization. Neither of these products of civilization can be regarded as an universal principle. But we may well ask ourselves if, as a profession, we are fulfilling our destinies best by one or the other. Are we justified in the utopian endeavour to establish highly equipped clinics in all parts of our provinces, to have a miniature Rochester in every community that can barely support a cottage hospital? In the utopian sense we might answer in the affirmative and suggest that no area is too remote for the highly trained specialists and the most elaborate equipment. Unfortunately, however, this is not Utopia nor is it likely that there ever will be such a place. In speaking of Utopia one feels disposed to ask like a cultured alderman in an Ontario town, "Wot we wants to know is, where is this 'ere place where the woodbine twineth?" Furthermore, one would find it difficult to find a Canadian bank whereon the wild thyme grows which would be a safe place to keep an overdraft.

It is therefore more expedient to look to the base hospitals, so to speak, for the highly specialized treatment, to be content with highly skilful first-aid and highly skilful emergency treatment in the frontiers, and to establish a proper organization of medical treatment between the frontier and the metropolis, between "no man's land" and the base. We must recognize our limitations, in theory at least, by the concept of advanced dressing stations, main dressing stations, clearing stations, stationary hospitals and base hospitals. Transportation, corresponding to field ambulances, aeroplanes, and hospital trains will solve the problem of referring difficult cases to the well-equipped centres. For the frontier, we must have the best possible type of general practitioner, with a well rounded education, with native resourcefulness, and a philosophic temperament. He must be free from the anxieties of collections, at least up to the point of adequate maintenance.

On the other hand the large specializing centres or bases will be subjected of necessity, and preferably so, to more or less competition, which makes for increasing effectiveness and excellence. These centres must support the necessary overhead and equipment. Organization will lead to good team play between the general practitioner and the specialist. But no such organization can exist unless the general practitioner is protected against the inroads of a pseudo-specialism. There must be no such subterfuge as a questionable specialization calculated to enlarge a general practice.

Our next topic is, logically, that of specialization. In this respect we must distinguish between two phases: first, that in relation to the physician who by virtue of his post-

graduate education may be qualified to do certain special work in the routine of general practice; and, secondly, the 100 per cent specialist who restricts his work to his specialty. The former is in competition with other general practitioners. The latter depends chiefly upon the general practitioner for an existence and is not a serious competitor of the general practitioner. These are fundamental considerations in any proposed legislation for specialism.

The next and not least important topic upon which I would deliver a message is the medico-legal function of the profession. We can hardly expect to hold a high place in the social scheme of things so long as we and the courts of law view with complacency the spectacle of three expert medical witnesses swearing on the Holy Writ the opposite of three other equally or better qualified specialists. How can an intelligent judge or jury take such evidence seriously? I am reminded of the young man who remarked to his girl friend, "Do you know that Mabel swears she has never been kissed." "Yes", said Millicent, "and I don't blame her for swearing." There seems to be only one remedy to prevent this medico-legal impasse and that is by a law which would render it impossible. The solution rests in the hands of the Attorneys-General. It is for them to arrange a plan by which sound and accepted medical opinion may be obtained for the establishment of medical facts that promote justice. The truth is the truth and there are no two ways about it. This is a subject for the urgent consideration of our Canadian Medical Association, and we as professional men should register our protests to the powers that be.

My next message is in regard to the sterilization of the mental defective. In the light of the experience of the Eugenics Board of Alberta there is no room for serious controversy upon this subject. Since the Statute went into operation in Alberta, nearly four hundred mental defectives have been sterilized. It is a peculiar biological phenomenon that in spite of mental defect so great as to make state care a necessity, the defective individual is no less than others, on the contrary is frequently more, given to the fascinating gesture of perpetuating the race. It is therefore essential to the workings of the law that follow-up care shall be instituted to prevent venereal disease and fearless prostitution. If it were practicable to reckon the financial saving to the Government in a period of 100 years, implemented by the sterilization of 400 mental defectives, there would be every reason to look for the ultimate payment of the bonded indebtedness of our national railways.

Lastly, and not least among the non-technical activities of our profession is the doctor's citizenship. Mr. Chief Justice Riddell once said to the Ontario profession, "The time has

passed when it was expected of a physician to feel a young lady patient's pulse, look at her tongue, shake his head, and then go out and have a drink with her father." Those were the days when the physician was referred to as "the old Doc"—a quite nice term of endearment, but not too complimentary to his citizenship. Nowadays, whether a general practitioner or a specialist, whether functioning in the great open spaces or on the 37th floor of a metropolitan sky-scraper, the physician is a responsible and important citizen. He has not only a citizen's rights but a citizen's obligations. Is he not even canvassed to make donations to all the charities, and in cash? More than this, he has the obligations of a specially trained citizen and as such his viewpoint represents an important element in the affairs of state. Indeed, I would express boldly that of all the people in the community the doctor is the best qualified to formulate and correlate social theories and practices. The legal profession, the financiers, and the political economists have had their innings as directors of human affairs. Knowing little or nothing of biology and geology, their handiwork has not been such as to create any profound measure of confidence in the body politic. There are many fundamental considerations that do not come within the purview of lawyers, economists, or financiers. The fundamental facts of biology and geology produce important political phenomena with which these good folk have little contact. An interesting, and perhaps the most enlightened, political experiment would be to create a Government consisting of doctors and engineers, with a few lawyers, economists, and financiers employed as technicians, whose business would be to furnish the requisite verbiage for preserving the dignity of the law, even when it is deliberately misinterpreted and misapplied. As a compromise with such a utopian scheme, the profession of medicine and the profession of engineering will accept for the present their proper place in an advisory capacity to Governmental deliberations affecting the diversified classes that constitute society. We simply ask that our advice shall exceed political expediency in importance. The engineer knows what can be done safely with physical and chemical forces for the betterment of mankind in his environment. The doctor is a biologist and has knowledge of human minds and human bodies; he knows when they are diseased, and by the same token, he can detect the pathological trends of society, of the group. Sound advice taken from medical sources would do much to lessen the expense and the volcanic social eruptions that follow ill-advised and ill-directed experimental research in economics and politics.

Political intrigue, while less violent, is no less malignant today in its operations than in

former times. Cancerous in its trend and in the long-run incurable, it can be at least alleviated. There are measures for the control of the pain and suffering that it engenders. It is to the medical profession that conscientious legislators must look in the not far distant future for such ways and means. The physician is as essential to the group as he is to the individual.

After all is said and done in the matter of reforms, we shall find that the way out is to reduce our social complexities to their lowest terms. As a somewhat sobering influence on the over-zealous uplifters of humanity, a chemically minded statistician has promulgated these startling facts: "A chemical analysis of the human body reveals that the average man, weighing 140 pounds, is composed of enough water to fill a ten gallon barrel (100 lbs. of water; rather highly watered stock), enough fat for 7 cakes of soap, enough carbon for 9,000 lead-pencils, enough phosphorus to make 2,200 match-heads, sufficient magnesium for one good dose of salts, enough iron to make a medium-sized nail, sufficient lime to whitewash a chicken-coop, and enough sulphur to rid one dog of fleas." At present prices we are, as junk, worth approximately one dollar. When we hear that a man is worth a million dollars, we, the cognoscenti, know better.

It seems that the great majority of world betterment schemes are based upon partial truths, so partial as to make mainly for the betterment of the proposer and his friends. The truth is that for the past quarter of a century the whole world has been on a rollicking "binge" and it is now the "morning after". The indications for treatment are mild placebos, as recommended by one famous John Collins, and reassurance to the patient that abstinence will make the heart grow stronger.

But it was not Bacchus who kept the world intoxicated for a quarter of a century. It was Pluto who is responsible for our present plight, if we have sound reason to refer to it as such. "By virtue of his power of giving fertility to vegetation, of swelling the seed cast into the furrows of the earth, and of yielding treasures of precious metal, he is justly viewed as a benevolent deity and a true friend of man, BUT there is another and a very grim side to his character. In this he appears as the im-

placable, relentless god whom no cost of sacrifice can persuade to permit anyone, once passing his gates, ever to return." It was Pluto who created the great hue and cry for the five shibboleths, Vision, Leadership, Challenge, Service and Thinking. And thus our Vision has become so acute that we have discounted our future by half a century of normal progress and development. Our Leadership has become such a popular hobby that nearly everybody is doing or trying to do it, while the remainder sing more or less complacently, "Keep on a doin' what you're doin' to me." Our Challenges have become so exacting and imperative that Governments are compelled to compromise with justice, and nations are standing with their hands at one another's throats. Our propaganda for Service has led to such a high degree of efficiency that the maintenance of it has gone far beyond the resources of high finance. Our Thinking has been directed mostly to utility- and fortune-building, with a pronounced leaning toward the unearned increment.

And what of recovery? How shall Paradise be regained? The formula is simple. Cut out the Vision business, the inordinate speculation on futures, and concentrate on the day's work. Put the quietus on indiscriminate Leadership by letting over-zealous reformers talk to empty chairs and disconnected radios. Stop issuing Challenges and replace them with honest, conscientious endeavour. Cut the vice out of Service and make service something with a soul in it instead of a machine. Above all let us stop Thinking—I mean thinking in terms of extravagant expansion and golden calves. Give thought a just reward when it is directed away from gold and dross towards art, literature, philosophy, and constructive science, towards those things we call by tradition "the humanities". Pluto has been given his quietus. Mars has had another innings and, like mighty Casey, has struck out. And now a gracious lady is knocking for admission. Let us open the door and admit as our patroness for the coming century the goddess Athene, or Minerva, and let her reign "in all gentleness and purity, teaching mankind to enjoy peace and all that gives beauty to human life in Wisdom and in Art."

If generous Honesty, Valour, or plain Dealing be the Cognisance of thy Family or Characteristick of thy Country, hold fast such inclinations sweet in with thy first Breath, and which lay in the Cradle with thee. Fall not into transforming degenerations, which under the old name create a new Nation. Be not an alien

in thine own Nation; bring not Orontes into Tiber; learn the Virtues not the Vices of thy foreign Neighbour, and make thy imitation by discretion not contagion. Feel something of thyself in the noble Acts of thy Ancestors, and find in thine own Genius that of thy Predecessors. Rest not under the Expired merits of others, shine by those of thy own.—Sir Thomas Browne.

Men and Books

NICOLAS DE BLEGNY AND THE FIRST MEDICAL PERIODICAL*

BY ALBERT G. NICHOLLS,

Montreal

Pioneers and pioneering have a certain attraction for most of us, whether it be in connection with the opening up of a new land, the establishment of a new fact or conception in scientific research, or the launching of some innovation in procedure that eventually "catches on" and becomes permanently operative.

I am the possessor of a small quarto volume, bound in vellum, which bears the imprint of Leonardus Chouët et Soc., Geneva, 1682. It is entitled *Zodiacus Medico-Gallicus, sive Miscellaneorum Medico-Physicorum Gallicorum, titulo Rccens in Re Medica et Naturali Exploratorum, unoquoque mense Parisiis Gallice prodeuntium annus secundus scilicet M.DC.LXXX. Authore Nicolao de Blegny R.G.C.O.* This is the Latin version of the *Nouvelles Découvertes sur toutes les Parties de la Médecine* of Nicolas de Blegny, of Paris, which latter, according to Garrison, is usually regarded as the first medical periodical in the vernacular. De Blegny's production first appeared in 1679 and had a short and somewhat stormy career. It was quickly translated into Latin by Theophilus Bonetus, a professor at Geneva and the distinguished author of *Sepulchretum*. My copy is the version of Bonetus and covers the second and third years of the run, namely, 1680 and 1681.

The claim that the periodical which de Blegny brought out was the first of a medical character to appear in the vernacular appears to be well founded. Indeed, it seems highly probable that it was the first of its kind to be published in any language. At least, I have not been able to find any trace of an earlier one. It is true that the Royal Society of London began to issue its Philosophical Transactions as early as 1665, but, while it published articles on subjects allied to Medicine, such as, for example, certain by Malpighi and van Leeuwenhoek, this was certainly not a medical periodical in the ordinary sense of that term. The first real medical journal to appear in English was, in fact, somewhat later than de Blegny's effort, and, so far as I have been able to learn, was the *Medicina Curiosa*, which ran from June 17 to October 23, 1684. One other medical journal, published in French, the *Journal de Savants*, or *Journal de Médecine*, ran de Blegny's fledgling a close

second, as it appeared only two years later, in 1681. This was edited by the Abbé J. P. de la Roque (apparently the same person as the Sieur de la Roche of the Abbé Bourdelot's letter quoted below). Like de Blegny's production, the *Journal de Médecine* had but a short career, as it came to an end, as such, in 1685, though it was continued in the next year by Claude Brunet, who later, again, edited the *Progrès de la Médecine*, a monthly magazine which ran from 1695 to 1709.

It would appear that, despite troublesome vicissitudes of fortune, de Blegny's venture proved popular, and set in motion a current of action that has never ceased since. His success, one may conclude safely, was due not only to the excellence of the matter which his journal presented but also because the time was ripe for its appearance. During the last thirty years of the seventeenth century the cultivation of science, literature, and philosophy had become an absorbing passion among the intelligensia and fashionables, both in France and England. These things became a vogue; numerous societies were formed; high and low met on a basis of a common and absorbing interest. What more natural than that journals should be established to keep permanent record of what went on? And so de Blegny started the first medical periodical, and others soon followed. It is said that it was de Blegny's journal that gave to Bayle the idea of publishing his *Nouvelles de la République des Lettres* (1684). As we shall see, the Abbé de la Roque, for some reason, was antagonistic to de Blegny and did his best to hamper him in his journalistic venture. Perhaps it was the latter's extraordinary and, as many thought, his undeserved success as a social and professional climber that aroused the Abbé's wrath; or, perhaps, it was de Blegny's activity and initiative in a field in which both were deeply interested that called forth the Abbé's jealousy. We do not know. But de Blegny had many enemies.

What little is known about de Blegny I have culled from the authorities mentioned below.¹ He is said to have been born at Paris in 1652. About his earliest years we have no information, but during his early manhood he was attached to the surgical College of Saint-Côme as a clerk or apprentice, and was occupied in making and, we presume, in applying, trusses and bandages. He also gave public lectures and demonstrations in surgery, pharmacy, and even, it is said, on wigs! This last subject for discourse need not surprise us, however, if we recall that at this time the surgeons were corporately associated with the barbers and wig-makers. As we are not informed that de

* Read at the Sixty-fifth Annual Meeting of the Canadian Medical Association, Section of the History of Medicine, on June 21, 1934.

Blegny was a cleric, and as, so far as we can learn, he did not assume that style, and, further, if we may judge him in the light of the current opinion of his time, we may infer that he belonged to that inferior group, "the surgeons of the short robe", whose professional attainments were usually of the slightest. There have been distinguished exceptions to this general rule, however, it may be remarked; the great Ambroise Paré, for example, was a "surgeon of the short robe".

De Blegny was an observing and a practical man, and, withal, an ambitious man. Dissatisfied with his humble position in the world he set out to climb. Soon his worldly position began to improve, and in a remarkable fashion. In 1678 he became surgeon-in-ordinary to the Queen, in 1683 to the Duc d'Orléans, and in 1687 to the King (Louis XIV), much to the surprise and, no doubt, the chagrin of his colleagues, for his professional qualifications by no means warranted such preferment. On the title-page of his "Bon Usage du Thé, du Caffé et du Chocolat pour la Guérison des Maladies", a copy of which I also possess, he is described as "Conseiller, Médecin Artiste Ordinaire du Roy et de Monsieur" (the Dauphin). The designation "Médecin Artiste" strikes one as rather happy, under the circumstances!

How de Blegny came to start a medical journal, and under what auspices, is not altogether clear. An academy of learned men, founded by the Abbé Bourdelot, was in existence about his time, which, beginning in a quiet way, sometime about 1637, under the patronage of the Prince de Condé attained a great vogue among the scientifically-minded and the fashionable, much as did the Royal Society of London. It became a public institution about 1670, when the publication of its proceedings attracted the attention of Paris to its meetings. At first the Academy was chiefly concerned with medical and physical subjects, including dissections and experiments, but later its scope was broadened. Whether, as one of the authorities consulted states, de Blegny set about the formation, in imitation of Bourdelot, of an association of learned men (called the Académie des Nouvelles Découvertes en Médecine), or whether this supposedly new Academy was really the older Academy of Bourdelot, or a section of it, I have been unable to decide. It is certain, however, that the relations between de Blegny and the Abbé were cordial, and the latter seems to have provided the former with much of his material and assisted him other ways. This is proved by a letter which Bourdelot sent to the Prince de Condé, his patron, in June, 1680. Part of it runs as follows.

"A little brochure of the Journals which the Sieur Blegny has published (sent to the Prince by the writer), with a collection of some new discoveries. There are in this collection the letter by M. Fagon and others of my own . . . Hereafter I will send your Serene High-

ness whatever he prints; however, he has begun to find strong opposition, the Sieur de la Roche (editor of the *Journal des Savants*) having obtained papers forbidding him to continue his publication. He came to me to interfere for him, which I shall do willingly."

On June 29th he sent another "Journal by Blegny the surgeon", to whom de la Reynie, the chief of police, at Bourdelot's instance, had given permission to continue publication.²

De Blegny's journal appeared first in 1679 and was announced to his English friends by Henry Justel in April of that year, and a small handbill was sent out carrying an announcement of its contents. It was published in Paris with several changes of title, a fact that suggests that de Blegny was meeting with difficulties. It was called *Les Nouvelles Découvertes sur toutes les Parties de la Médecine, recueillies en l'Année 1679 par Nicolas de Blegny; Le Temple d'Esculape, ou le Dépositaire des Nouvelles Découvertes . . . dans la Médecine*, 1680; *Journal des Nouvelles Découvertes concernant les Sciences et les Arts qui font Partie de la Médecine*, 1681-83. The articles and reports appeared monthly and the new magazine seems to have met a need, for it attained speedy popularity among scientific men and was translated into German, appearing at Hamburg under the title of *Monatliche neueröffnete Anmerkungen*, and into Latin, at Geneva, as *Zodiacus Medico-Gallicus*. The Latin version ran from 1680 to 1685. Whatever de Blegny's shortcomings may have been we clearly have to thank him for an original and fruitful idea—too fruitful, as some of us are inclined to think, nowadays!

As might be expected in the case of one whose rise had been so spectacular, his success seems to have gone to his head, and de Blegny soon got into trouble. His medical magazine ran along for three years, when publication was halted by a prohibition of Parliament because of some offensive personalities it contained. De Blegny was equal to the occasion. He dropped his name from it and gave it over to the editorship of Gautier, a physician of Niort, who lived at Amsterdam. It now became known as the *Mercurie Savant* (1684). It is said (Garrison) that in the metamorphosed periodical de Blegny published some satirical sketches of his contemporaries which gave rise to another "fruitful" idea—the city directory.

So elevated was de Blegny by his success at Court that he undertook to resuscitate the defunct Order of Saint-Esprit, once founded at Montpellier, of which he, without warrant, constituted himself Chevalier-Commander, and he even went the length of instituting suits at law against certain persons whom he accused of appropriating the revenues formerly pertaining to the Order. About the same time, and this was his culminating folly, he established a hospital for the poor at Pincourt. The King.

sit." But there are more up-to-date references; many contemporaries are mentioned, among them Sydenham, on fevers and Willis, on fermentations.

In final appraisal of the *Zodiacus*, it may be said that there is less Galenism and astrology in it than one would expect, and, apart from the polypharmacy and reliance on useless drugs and other substances characteristic of the time, there is much of practical value to be gleaned from its pages. In the light of the knowledge of the time it is a very creditable performance for a first effort, and we have to thank a somewhat small man for a big idea.

I desire to thank Professor Henry Sigerist, of Johns Hopkins University, and Dr. W. W. Francis, of the Osler Library, Montreal, for their courteous assistance in the preparation of this paper.

AUTHORITIES

1. Garrison, F. H.: *An Introduction to the History of Medicine*, Saunders, Phila. and Lond., 1921, pp. 272, 275 and 282.

Kestner, C.: *Medizinisches Gelehrten-Lexicon*, Johann Meyers, Jena, secl. Erben, 1740, p. 117.

(a) *Acta eruditorum* an. 1682, mens. Jul. p. 220 *et seq.*

(b) *Bibliotheca Rivinian.*, p. 457.

Hirsch, A.: *Biographisches Lexikon der hervorragenden Aerzte*. Urban u. Schwartzberg, Wien u. Leipzig, 1884, vol. I, p. 483.

Panckoucke, C. L. F.: *Dictionnaire des Sciences Médicales*, Paris, 1820.

Béchet-Jeune: *Dictionnaire Historique, Ancienne et Moderne*, Brussels, 1828, vol. I, p. 415.

2. Brown, H.: *Scientific Organizations in Seventeenth Century France*, Williams and Wilkins, Baltimore, 1934, p. 252.

A LIVING WREATH

(To Dr. F. N. G. Starr)

A living wreath I offer to the living,
To one whose sight has met eternal dawn,
And whose brave spirit travels all untired
Through the long grooves of knowledge ever on.

God still arrives in us through human agents,
And Science is a patient son of light;
Selfless, exact, and humble in its practice
Channelling hope through centuries of night.

Time may recall a spirit that is timeless,
But time or death—whichever it may be—
Only makes clear the purpose of a being
Which the advancing hand of Truth set free.

So flowers that fade are not for this explorer
Whose pathway never led through gardens dim;
These words may fade, but not life's high endeavour,
And only living thoughts are meant for him.

KATHERINE HALE

Association Notes

The Sixty-Fifth Annual Meeting of the Canadian Medical Association

The Sixty-Fifth Annual Meeting of the Canadian Medical Association was held at Calgary from June 18th to 22nd inclusive, and from every point of view was highly successful. The program was excellent, the entertainment highly entertaining, and the attendance better than was anticipated. All the arrangements were well planned and worked out smoothly, which speaks much for the efficiency of Dr. J. S. McEachern, the President-elect, and his local committee. The sojourn of the visitors to Calgary will long be a pleasant memory. The entertainment provided was unique—trips to the Prince of Wales' Ranch, with return to Calgary via the Bar-U Ranch and the Turner Valley, with its spectacular oil-wells; the Stampede at the Sarcee Indian Reserve; and the Motor Drive to Banff and Lake Louise. Less spectacular and more conventional, but still exceedingly happy, were the Reception held by the President and Mrs. McEachern at the residence of the Hon. Patrick Burns, and the Garden Party at the Central Alberta Sanitarium, Keith. The Association Dinner and Dance turned out to be an overflow meeting and was much enjoyed. The Blackader Address, delivered on the evening of June 21st by Dr. James Craigie, of the Department of Hygiene, Toronto University, on "Some aspects of virus infections, with special reference to virus diseases of childhood", while dealing, perhaps, with a somewhat abstruse subject, was put so simply and practically that it could only be described as worthy of the occasion and it aroused much favourable comment. The attendance was large.

The first two days of the convention were given up to meetings of the Executive Committee and Council, at which many important topics were considered, notably, revision of the by-laws, blood transfusion service, the establishment of a Cancer Campaign for Canada, group insurance for hospitalization, the attitude of the Department of Pensions and National Health towards maternal and child welfare, proprietary and patent medicines, puerperal septicæmia, and, perhaps, most important of all, the outline of a plan for Health Insurance. The full reports, together with pertinent discussion will be submitted as a supplement to the September issue of the *Journal*. In view of magnitude of the issues at stake, this Supplement should be read not only by members of the Association but by all members of the medical profession. Particularly do we call attention to the report of the Committee on Economics which deals with a difficult and somewhat controversial subject in an illuminating and constructive way. This

report alone is "worth the price of admission" to the Association. Much regret was expressed at the absence, through illness, of Dr. A. T. Bazin, whose thorough and efficient work on behalf of the Association is well known. He is replaced as Chairman of Council by Dr. George S. Young, of Toronto.

Attention should be called to the pleasing fact that, in response to a cordial invitation from the Board of Regents of the American Medical Association, the Canadian Medical Association will meet jointly with the American Medical Association at Atlantic City sometime in June, 1935. Professor J. C. Meakins, of Montreal, will be our President on that historic occasion.

On Monday, June 18th, the Council were the guests at luncheon of Dr. McEachern, the President-elect, and at that pleasing function the President, Dr. G. A. B. Addy, of Saint John, N.B., delivered his valedictory and installed his successor.

Doctor Addy spoke briefly of some of the activities of the Association during his term of office and discussed some of the major problems. The Executive had devoted special study to several important subjects. A study of American, British and Canadian plans for health insurance had engrossed much time, and it would take a still further period before a final scheme would be ready for presentation. The Proprietary and Patent Medicine Act had been seriously considered and several suggested amendments had been forwarded to the department of health in Ottawa. Medical relief offered another problem. A delegation had waited on the prime minister and had presented the situation as it existed in Canada, and particularly in the west. The prime minister had said that this was an obligation on the provincial governments and that he had so informed the premiers. Under Dr. A. Primrose, of Toronto, (a Past-president of the Association) a committee had devoted much study to the cancer problem and at this convention meeting, a report from them was promised, looking to effective action.

Dr. Addy thought that the time was ripe for the Canadian Medical Association to take up the question of the qualifications of the specialist and to pass on its conclusions to the provincial boards. Provincial boards were very exacting as to admission of medical men into different provinces for the practice of general medicine and surgery, but this was not so in regard to specialists. Nowadays it was possible for a doctor to go to one of the larger centres, spend a few weeks, and return as a specialist. Such a course was not in the interests either of the patient or of the man who had thus qualified as a specialist. In Dr. Addy's opinion a "specialist" should be able to boast five years in general practice; a minimum standard of post-graduate work in some recognized medical school and hospital; and should, in company with

others so qualified, be regarded as specialist in his own province and by the Medical Council of Canada.

"The refinement of his relation to one part of the art of medicine might make him a poor general adviser to patients, because of his narrower view of their condition." Some maintained that the vast amount of knowledge now to be attained on every phase of medicine, threatened the life and usefulness of the general practitioner. Such was not the case, Dr. Addy believed. Instead, a new, but as yet unrecognized, field was opening before him. The general practitioner might recognize when special consultation was necessary. Without his wide knowledge of general medicine, how was the patient to know which specialist to consult? It was to be regretted that so many feel they must take up specialization immediately on graduation. In concluding, Dr. Addy voiced his thanks to those who had offered courtesies during his term of office, paying particular tribute to Dr. T. C. Routley, of Toronto, General Secretary, whose able assistance had furthered the work of the Association during the past year.

On the conclusion of his address, Doctor Addy inducted into office the new President, Dr. J. S. McEachern, of Calgary, and invested him with the handsome chain of office. Doctor McEachern acknowledged the honour suitably, in a few words, but his Inaugural Address proper was not delivered until the General Session on Wednesday following. This address appears in the present issue of the *Journal*.

On the evening of June 18th the Council were the guests at dinner of the Calgary Medical Society and were addressed by Hon. Dr. Egbert, Lieutenant-Governor of Saskatchewan. His remarks were suitably acknowledged by Dr. G. C. VanWart, of Fredericton.

At the Luncheon Meeting on June 19th the guest-speaker was the Ven. Archdeacon C. Swanson, who addressed the gathering on "Religion and medicine". He said, in part.

"I take it that the surgeon's job is to adjust human machinery, and the physicians' to correct imbalance of functioning, in the full expectation and faith that Nature, or the vital life force, will assist in all stages and complete the healing.

"Through experience we know that the power to live and the will to live are subject to spiritual influences, such as needs of loved ones, uncompleted work, or other forces of love and ambition," he continued. "It is tremendously influenced by another great force — that of religion, and the day has gone when religion dealt only with the hereafter. Today it has become almost a by-product, with its chief aim the fullness of life.

"Religion is the means by which man ties himself up to God, the Source of the vital life force. It ought to be obvious that a perfect union between man and God should result in a

perfect flow of vital force—namely, in perfect health, even in superabundance, as in the case of Christ. Sin is conceived of as an obstruction, cutting off either completely or partially the vital force.

"Absolution, prayer and sacrament all have their place in the sick room," he went on, "as well as in the world of active life. It is quite obvious that a life of moral uprightness, of disciplined appetite, and above all, of contented thought and emotional life, must prove a large factor in healthy living or satisfactory recovery." The archdeacon concluded with a plea for a spirit of cooperation and real fellowship in the mystery of healing and right living.

A cordial welcome to Calgary was extended delegates to the Canadian Medical Association convention by Mayor Andy Davidson at a luncheon on Wednesday, June 20th. His Worship stated that citizens were honoured by the fact that a Calgary physician, Dr. J. S. McEachern had been chosen President of the Association.

Dr. George S. Young, Toronto, outlined the functions and responsibilities of the Council of the Canadian Medical Association. One responsibility, he said, was the education of the public in matters of health. Thus informative medical articles were published in 369 newspapers under the auspices of the Association. Dr. Young expressed the value of post-graduate work, hospital service, and the multifarious undertakings of the Association Council in the past.

In the evening the Council were the guests of the Alberta Medical Association. Greetings were extended to the visitors by the President of the Provincial Association, Dr. R. B. Mooney, of Edmonton, and by the Hon. George Hoadley, Minister of Health, who, as a layman, voiced the people's appreciation of the doctors' calling.

The guest speaker was Mr. L. W. Brockington, K.C., City Solicitor for Calgary, who in an appreciative and witty, not to say pungent, way, paid tribute to the medical profession. An incisive and brilliant speaker, Mr. Brockington held his hearers in thrall from start to finish. No profession had gained more from overwhelming adversity than had ours. Not in material but in spiritual gains had the medical profession marked the past years. Opening the gates of mercy and combating fear, its members had combined humble loyalty, divine fidelity and the gift of compassion in their service. The very foundation of medical science was to be found in the noble concept which offered science enriched and ennobled by love.

Appealing to the trinity of hand, head and heart, the medical profession promised its members lonely persistence, struggle, endeavour, wonder, joy, reverence and search in quiet for the secrets which might be revealed to them. "As religion has become more rational, science has become more sanctified" the speaker de-

clared, paying tribute to that great body of men, present and past who in the true scientific spirit, imbued with a proud humility, had given their discoveries to suffering humanity, often without any just recompense or recognition. It has been granted few to achieve distinction, but the battles are won by the tattered battalions, fighting to the end. The justice of the great, the prayer of the faithful, the bravery of the valiant and the skill of the surgeon; these four were the pillars embodied in proverb by the founders of the art.

One of the oldest doctors in the province, in point of years in practice, Dr. A. Blais, of Edmonton, proposed the toast to the Canadian Medical Association. Recalling early medical history in this province, he mentioned such names as those of Dr. Brett, Dr. McKidd, Dr. Rouleau, Dr. Harrison, Dr. Braithwaite and Dr. Roy, familiar on his arrival thirty-four years ago. Opposition to the encroachment of the state in the field of private practice; encouragement to members of the medical profession in entering the political arena; and creation of a fund for those less fortunate members of the profession suffering in times of financial stress were items of importance in Dr. Blais' address.

Dr. Léon Gérin-Lajoie, of Montreal, responding to the toast to the Canadian Medical Association voiced thanks to the publicity committee which had this year prepared for the first time in the Association's history, a duplicate of the convention program in French. On behalf of his medical associates he expressed thanks for the excellence of the reception accorded the visitors.

On the occasion of the Association Dinner and Dance, held on June 20th, an address was to have been given by the Right Honourable R. B. Bennett, Premier of Canada, but unfortunately he was prevented from being present. A pleasing feature, however, was his gift of a corsage of roses to all the ladies present at the function. This little courtesy was much appreciated. An Address of Welcome was given by Honourable William Leigh Walsh, Lieutenant-Governor of Alberta, who contrasted the medical and legal professions. President R. C. Wallace, of the University of Alberta replaced Mr. Bennett, and gave a splendid address, which will be reproduced in our pages shortly. A pretty tribute was paid the widows of three Calgary pioneer doctors at the dinner when His Honour, the Lieutenant-Governor of Alberta, on behalf of the Rt. Honourable R. B. Bennett, Prime Minister of Canada, presented bouquets to Mrs. N. J. Lindsay, Mrs. Park, and Mrs. H. G. McKidd, who were seated at the head table.

Other features of the convention were the Historical Exhibit, which was put together by Dr. Heber C. Jamieson and his collaborators, of Edmonton, the Pathological Museum and the Commercial Exhibit.

Doctors who had time free from scientific sessions and social programs found these exhibits of special interest.

Something of the medical profession's history in this province was indicated in the Section of Historical Medicine where many pictures, manuscripts and charts testified to the courage and foresight of pioneer doctors. From simple one-roomed hospitals with the most meagre equipment to the magnificently equipped institutions of the present day was the long step taken by Alberta medical scientists, whose handsome hospitals and laboratories were pictured for the information of the Canadian Medical Association visitors.

The Pathological Section contained some interesting intra-cranial specimens from the pathological department of the Alberta Medical School. Also included in the pathological display were charts showing the "History of the development of Antigens of infectious disease agents"; Conception of Denaturation of Antigens; Preparation of undenatured bacterial antigens; Comparison of the Cardinal Properties of Antigens; Prevention of Pertussis; and the Special Biological Treatment of Pertussis. Whooping-cough was shown as ranking high in the causes of child-mortality as outlined in the comparative statistics chart, as the following percentages showed: Diphtheria, 1.2; Pertussis, 0.7; Measles, 0.6; and Scarlet Fever, 2.4.

Ayerst, McKenna and Harrison, Ltd., of Montreal, pharmaceutical and biological chemists, manufacturing scientific and semi-scientific products, had an interesting section of their exhibit at the Canadian Medical Association convention devoted to a display of digitalis. This drug, which has been developed in Canada, and particularly in Vancouver Island, largely during the past year, with this Montreal company prominent in the field. Ayerst, McKenna and Harrison have a license from McGill University to go into the biological field; they are also pioneers in vitamin therapy, and are the first company in Canada to introduce biological chemistry into pharmaceuticals in this country. Canadian products are used wherever possible as a basis for their products.

Frosst's laboratories in Montreal were graphically depicted at their exhibit where lantern pictures offer a view of the work being done there. Research in vitamins is also engrossing the twelve trained technicians and the two medical men employed at their headquarters.

Surgical appliances form another section of the exhibits, with the S. H. Camp and Company of Canada, Ltd., Windsor, Ont., making the display.

Useful x-ray pictures and kodak equipment formed the exhibit sponsored by the Canadian Kodak Company, Ltd., Toronto. Dental films and the essentials for clinical photography were interestingly shown.

Down Brothers, Ltd., of London, England, had an amazing array of surgical, medical and specialists' instruments in stainless steel, which occupied a large section of the show and proved of particular interest to the doctors. Another display was that of the J. B. Lippincott Company, of Montreal, which showed recent medical and scientific books on a great variety of subjects.

Hospital Service Department Notes

Courtesies to the Medical Staff

A subject frequently discussed at hospital conventions is the extent to which hospitals should give "courtesies" to the members of the medical staff. It is realized that the hospital can be of great assistance to the doctor; for instance, by sterilizing his gloves and gowns for outside work, by providing him with sterile glucose and saline, and in many other ways. At the same time hospitals must balance their budgets. These courtesies cost money and take time and, for that matter, may actually contribute to decreased occupancy by facilitating treatment at home. This subject was one of many considered by the Committee on the Problems of the Small Hospital of the Canadian Hospital Council. In its recent report (Bulletin No. 5) the Committee selected three viewpoints submitted to it as typifying the opinion of hospital workers as a whole.

1. From a Trustee:—

"It is always advisable to extend courtesy to staff physicians in the matter of sterilization, gloves, loaning of splints, etc., but the Superintendent should always keep a strict record of articles and dressings used in practice outside the hospital, collecting the cost of same if used and if articles loaned are not returned."

2. From a Superintendent:—

"I believe it is advisable to extend courtesy to local doctors by (a) sterilization of packs, drains, gloves and supplies; (b) loaning crutches, splints and special treatment articles; (c) doing outdoor dressings where no outdoor service is maintained, when necessary; (d) sending out graduates for experience to assist with deliveries in the poorer homes, who can assist both patient and doctor as well as gain personal experience.

"The reward the hospital receives for such courtesy extended is the goodwill of the medical profession and the community which it serves. The satisfied patient and doctor are the best recommendations the hospital can have."

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

3. From a Doctor:—

"The hospital may, if it wishes, make provision that the little courtesies such as sterilization of gloves and supplies, loaning of instruments, etc., will be extended only to those doctors who keep their records up to date. The medical man, particularly with a large country practice, deeply appreciates such aids to his practice, but I think he should be made, in one way or another, to understand his obligations towards the hospital for this service, and that a reasonable return in the way of cooperation is to be expected. By helping him in a way inexpensive to the hospital, perhaps the institution itself is really performing part of its duties as a health centre for the community. Approaching this problem more minutely, such services are often appreciated more if the doctor, for example, is asked to purchase his own gauze and absorbent cotton, even make up his own dressings, the hospital doing him the favour of sterilizing these goods. In this way only can he be taught the value of these articles, and economy thus learned in his own practice is generally carried out in the hospital itself.

"In the same manner splints may be loaned if there is not too great a depletion in the supply caused by such loans. When such a loan is made, even to the poorest patient, a small amount, possibly but a small fraction of the value of the splint, should be left with the hospital as an earnest of its care while in use and its safe return. The whole situation in any small hospital is one that must be treated with sympathetic cooperation between the medical men and the hospital management. A desire to give as well as to take on the part of each, generally results in satisfaction to both."

These viewpoints are to be commended indeed, and one is pleased to note that in the great majority of our hospitals throughout Canada, particularly the smaller ones, such arrangements prevail. The doctors do appreciate these courtesies.

IMMUNIZATION WITH BACILLUS PERTUSSIS VACCINE.

—L. Sauer used *Bacillus pertussis* vaccine (1 c.c. = 10 billion bacilli), made from recently isolated, strongly hæmolytic strains, grown on Bordet medium made with freshly defibrinated human blood, as an immunizing agent in 394 selected young non-immune subjects. The total of from 7 to 8 c.c. (70 to 80 billion bacilli) is divided into three weekly (bilateral) injections of 1, 1.5 and 1.5 c.c., respectively. In the course of five years the author's control series of 31 children in twenty-four of the families contracted unquestionable whooping-cough. Twenty-nine of the injected children were exposed throughout the incubation, catarrhal and paroxysmal stages, but none contracted the disease. Not one of 162 injected children accidentally exposed has had a cough that in any way resembled pertussis. Active immunity is completed in four months and lasts for years. Infants withstand the injections remarkably well. The best age for immunization is the second half year of life.—*J. Am. M. Ass.*, 1933, 101: 1449.

Provincial Association Notes

The Alberta Medical Association

The twenty-ninth annual meeting of the Alberta Medical Association was held on June 22, 1934, following a luncheon at the Palliser Hotel, Calgary. Dr. B. R. Mooney, the president, occupied the chair. This year a scientific program was dispensed with, as the annual meeting of the Canadian Medical Association was in progress at this time. The chief speaker at the meeting was Dr. T. C. Routley, General Secretary of the Canadian Medical Association.

The following officers were elected for 1934-1935: *President*, Dr. D. S. Macnab, Calgary; *First Vice-president*, Dr. Fulton Gillespie, Edmonton; *Second Vice-president*, Dr. R. A. Walton, Stony Plain; *Treasurer*, Dr. A. E. Shore, Calgary; *Secretary*, Dr. G. R. Johnson, Calgary.

Executive Committee: Drs. G. A. Davidson, Ponoka; J. C. Shillabeer, Wetaskiwin; York Blaney, High River.

Representatives on the Council of the Alberta Medical Association: Drs. D. N. MacCharles, Medicine Hat; R. M. Reid, Vegreville; J. Scott, Edmonton.

Representatives on the Council of the Canadian Medical Association: Drs. D. S. Macnab, Calgary; H. A. Gibson, Calgary; G. R. Johnson, Calgary; A. E. Archer, Lamont; J. W. Richardson, Calgary; A. H. Meneely, Coronation; J. K. Mulloy, Cardston.

Provincial Editorial Board of the Canadian Medical Association: *Chairman*, Dr. G. E. Learmonth, Calgary; Drs. Heber Jamieson, Edmonton; E. L. Pope, Edmonton; P. M. Campbell, Lethbridge; B. C. Armstrong, Medicine Hat.

Auditors: Drs. G. A. Anderson, Calgary, and J. V. Follett, Calgary. G. E. LEARMONTH

The New Brunswick Medical Society

The 54th Annual Meeting of the New Brunswick Medical Society was held at Woodstock, N.B., July 10th and 11th. The meetings were held in the Woodstock Golf Club, and a quite satisfactory attendance was registered. Dr. P. H. LaPorte, President, presided at all meetings.

The scientific program included several papers of more than usual interest. Dr. R. Nelson Hatt, of Springfield, Mass., discussed "Diseases and injuries to the hip joint". Discussion on this paper was lead by Dr. E. F. Wolverton, Woodstock, N.B. In a subsequent session Dr. F. J. Cotton, of Boston, Mass., gave a synopsis of his methods of treatment of fractures. These two papers are mentioned together because they had much in common and the interest they elicited was remarkable, as both subjects enter largely into general practice. "Anæmias and

their treatment", by Dr. J. C. Meakins, Montreal, and "Hæmorrhage in the last trimester of pregnancy", was another pair of papers presented by Montreal physicians which deserved the attention they received. Both papers evidenced a large amount of work in their preparation and had a general appeal. These papers were discussed by Dr. R. A. H. McKeen, St. John, and Dr. C. L. Gass, Sackville. The program was completed by papers by Dr. D. W. McKenzie, Montreal, whose subject was "Mechanical factors in renal infection", in which relation he showed a number of cases with renal disease in children. Dr. Dudley Ross, Montreal, discussed "The repair of cleft palate, showing functional results". This last paper was discussed by Dr. G. C. VanWart, Fredericton. The principle of controlled discussion of all papers presented was re-introduced at this meeting and met with a very favourable reception.

The entertainment program, as was to be expected, was an extremely fascinating one. The New Brunswick Medical dance on Tuesday evening was very largely attended and appeared to give a great deal of pleasure to those attending. The New Brunswick Medical dinner the following night also had a large attendance, and at this function Dr. J. C. Meakins, President-elect of the Canadian Medical Association, gave an informal talk referring in a broad way to the trend in state medicine, and outlining the hopes of leadership as held out by the Canadian Medical Association. The doctor's remarks were given close attention by a fair-sized gathering. Dr. F. W. Mitchell, of Houlton, Me., presented a witty discourse in the course of which he brought greetings from the Aroostook County Medical Association.

The VanWart trophy for golfers was won by Dr. Wm. Warwick, Fredericton. This is an annual competition held under handicap rules.

The business program occupied two sessions. The arrangements with the Workmen's Compensation Board occupied a large portion of one morning's discussion, and it was resolved that a determined effort will be made this year to return to the normal schedule of fees under the Workmen's Compensation Board Act. For the last several years these fees have been taxed 15 per cent, owing to the depression. A Buffer Committee to deal with Workmen's Compensation Board matters was re-elected. This committee includes Drs. R. A. Hughes, Chairman, O. B. Evans and Jos. Tanzman, members. This committee was felicitated on the satisfactory handling of the claims arising during the year.

Dr. S. H. McDonald, Registrar of the New Brunswick Council of Physicians and Surgeons presented his usual report, and stressed the fact that any reduction in yearly registration fees could not be contemplated as the province was privileged to enjoy one of the lowest fees in

Canada, and the cash balance at the end of the year was extremely low. Dr. McDonald's discussion of this subject was well received and successfully ruled out any feeling of dissatisfaction in this matter.

The place of meeting for next year was left in the hands of the Executive.

Election of officers resulted as follows: *President*, Dr. D. C. Malcolm, Saint John; *Vice-president*, Dr. J. M. Barry, Saint John; *Second Vice-president*, Dr. A. L. Gerow, Fredericton; *Treasurer*, Dr. R. M. Pendrigh, Saint John; *Secretary*, Dr. A. S. Kirkland, Saint John.

The present elected members of the Council of Physicians and Surgeons were returned for another term of office. These include Drs. R. W. L. Earle, Perth; J. M. Barry, Saint John; G. A. B. Addy, Saint John; H. E. Britton, Moncton, and P. H. LaPorte, Edmundston.

Additional members to the Canadian Medical Association Council were elected as follows: Drs. J. R. Nugent, Saint John; J. M. Barry, Saint John; G. C. VanWart, Fredericton; R. W. L. Earle, Perth; C. J. Veniot, Bathurst.

Additional members to the New Brunswick Executive were elected as follows: Drs. J. R. Nugent, Saint John; C. J. Veniot, Bathurst; H. E. Britton, Moncton; Arthur VanWart, Fredericton; J. F. L. Brown, Woodstock, and W. E. Gray, Milltown.

The outstanding success of this meeting again proved that the choice of a small town as a place for a convention is perhaps more satisfactory than that of one of the larger cities.

A. STANLEY KIRKLAND

The Prince Edward Island Medical Society

The Annual Meeting of the Prince Edward Island Medical Society was held in Summerside, on July 13th. The guest speakers were Drs. J. C. Meakins, Grant Fleming, and Dudley Ross, all of Montreal. Some forty local doctors attended the morning and afternoon sessions.

The following officials were elected for the ensuing year: *President*, Dr. V. L. Goodwill, Charlottetown; *Vice-president (Prince)*, Dr. J. B. Champion, Alberton; *Vice-president (Queens)*, Dr. F. W. Tidmarsh, Charlottetown; *Vice-president (Kings)*, Dr. A. A. McDonald, Souris; *Treasurer*, Dr. I. J. Yeo, Charlottetown; *Secretary*, Dr. J. W. McKenzie, Charlottetown. *Executive Committee*, Drs. W. B. Howatt, L. Farmer, E. S. Giddings, P. McIntyre, R. D. McNeill; *Auditors*, Drs. B. C. Keeping and L. B. McKenna; *Editorial Board, Canadian Medical Association Journal*, Drs. J. A. McPhee and R. F. Seaman. *Delegates to Canadian Medical Association Council*, Drs. J. F. McNeill, W. P. McMillan, and J. A. McPhee. *Delegates to Prince Edward Island Council*, Drs. J. F. Mc-

Neill, G. F. Dewar, H. D. Johnson, E. T. Tanton, R. F. Seaman, I. J. Yeo, and W. P. McMillan; *Public Health Committee*, Drs. W. P. McMillan, B. C. Keeping, P. A. Creelman, J. A. McPhee, and A. W. Ross; *Entertainment Committee*, Drs. F. W. Tidmarsh, I. J. Yeo, J. D. McGuigan, L. B. McKenna, and G. L. Smith.

During the morning session, in addition to routine business, the subjects of Medical Relief, the Control of Heroin, Child-welfare, and others were discussed and voted upon. Dr. B. C. Keeping, reporting for the Public Health Committee, gave a summary of this committee's activities in small-pox vaccination and diphtheria immunization. The study of infant mortality during the last ten years showed Prince Edward Island to have the second-best figures in Canada, 64.5 per thousand in children of one year of age. These figures were bettered only by British Columbia, with 51.5 per thousand. In discussing ophthalmia neonatorum he announced the free distribution of silver nitrate ampoules for protecting the eyes of the newborn. With regard to tuberculosis he urged more frequent health examinations, particularly in the case of suspects and contacts, to reduce the number of advanced cases still coming to the Sanatorium.

Dr. W. J. McMillan introduced Dr. A. J. Murehison, Jr., recently appointed medical superintendent of Faleonwood Insane Institution. Dr. Murehison has had five years' post-graduate training in mental work. His appointment marks a new era in the treatment of mental diseases in Prince Edward Island. The society extended generous and well-deserved praise to Dr. W. J. McMillan, our medical premier, in consideration of the very valuable work he is doing in furthering all lines of public health endeavour.

Beginning the afternoon session, Dr. Grant Fleming conveyed the greetings of the Canadian Medical Association to the provincial society, and touched upon various public health measures under consideration at the present time, which will later be submitted to the local societies for approval. The remainder of the afternoon was taken up with clinical papers. Dr. J. C. Meakins delivered a lucid discourse on the "Anæmias", paying particular attention to the hypochromic anæmias of pregnancy, and emphasizing the need of large iron dosage. Dr. Dudley Ross delivered a very excellent paper on a difficult subject, "Cleft palate", assisted by lantern slides. Dr. P. A. Creelman of Charlottetown, in his talk on "Pleurisy", emphasized the need of adequate treatment in every case of pleurisy to avoid the possibility of tuberculosis developing later.

It was decided to hold the Society's next Annual Meeting in Charlottetown.

J. W. MacKENZIE

Medical Societies

The Kent County Medical Society

The regular monthly meeting of Kent County Medical Society was held in the Public General Hospital on May 17, 1934. Dr. George A. Ramsay, Associate Professor of Surgery of the University of Western Ontario, spoke on "The pitfalls in the treatment of common fractures". He illustrated his talk with lantern slides. Dr. C. C. White presented a case for diagnosis.

The Ontario County Medical Association

The annual meeting of the Ontario County Medical Association was held at the Ontario Hospital, Whitby, on June 22nd, with about fifty present, including visitors from the York, Durham and Northumberland Associations. A fine address was delivered by Dr. Horne, superintendent of the Ontario Hospital, Orillia, on the subject, "The social treatment of mental defectives." Dr. Tennant, superintendent of the Ontario Hospital for Epileptics, Woodstock, spoke on "Epilepsy and other convulsive disorders." Then the Hospital at Whitby presented a symposium on "Common mental disorder," ably led by the superintendent, Dr. G. H. Stevenson, and Drs. Senn, Montgomery and McNeel making contributions.

An interesting pathological display was sponsored by Dr. Walker, of the local hospital staff.

During the afternoon a handsome golf bag was presented to Dr. Webster, of Whitby, who recently retired from the Whitby Hospital staff after many years of faithful service. This was a gift from his fellow members of the Association and a tangible token of the esteem in which he is held by all members of the medical profession.

The new *President* is Dr. Archibald McKay, of Oshawa; *Vice-president*, Dr. O. G. Mills, Oshawa, and *Secretary-Treasurer*, Dr. B. C. Wilson, Oshawa.

The Peel County Medical Society

The Peel County Medical Society held their meeting in Brampton on June 22nd. Dr. W. J. Gardiner, Toronto, the speaker for the evening, dealt with the subject "Manipulative surgery". Dr. Gardiner's lecture was unusually interesting, in as much that he dwelt on a subject that was discussed for the first time before the Society. Manipulative surgery has too long been in the hands of men outside of the medical profession and Dr. Gardiner is doing everything to put it where it rightfully belongs.

Following this address Dr. Shier, of Uxbridge, the District Counsellor, explained to the

Society the work of the Ontario Medical Association and its relation to the county organizations.

The Peterborough Medical Society

In concluding activities for the year 1934-35, the Peterborough Medical Society mingled business with pleasure when the annual meeting, held at the Kawartha Golf and Country Club, on June 12th, was followed by a social evening for physicians and their wives. Existing business was dealt with expeditiously, and the retiring president, Dr. H. V. Dobson, reviewed events of the past year, making some suggestions for the future. He pointed out that for several years there had been a decline in the Society's activities, as evidenced by the number of meetings held and the average attendance. While this year had been marked by a definite improvement, the situation was still unsatisfactory from the point of view of attendance, since only about one-third of the medical population of the county had attended the splendid series of meetings arranged. The paid-up membership constituted 62 per cent of the physicians in the county. There were ten regular meetings and two special meetings. The speakers and their subjects were: Dr. John Oille, Toronto, "The differential diagnosis of chest pain"; Dr. N. E. Berry, Kingston, "Pathological conditions of the kidney"; Dr. J. W. S. McCullough, Toronto, "Cancer"; Dr. Van Wyck, Toronto, "Toxæmias of later pregnancy"; Drs. T. P. McCullough, Waite and Fraser, Peterborough, "Symposium—acute infections of the respiratory tract"; Dr. Rosecoe Graham, Toronto, "Surgical therapy in gall-bladder disease"; Dr. H. G. Pretty, Montreal, "The rectum"; Dr. F. A. Logan, Lindsay, "Dysmenorrhœa".

The Halliday Memorial Lecture was delivered on May 22nd by Dr. L. J. Austin, of Kingston, to an audience of some four hundred persons in the auditorium of the Collegiate Institute. The speaker dealt in an effective and entertaining manner with the subject, "Quacks, ancient and modern", his address exciting favourable comment both among the profession and the laity.

The enjoyable program of entertainment, consisting of bridge, lunch and dancing, which followed the business meeting, was arranged by a committee under the chairmanship of Mrs. F. C. Neal.

The officers elected for the ensuing year are: *Hon. President*, Dr. F. C. Neal; *President*, Dr. W. S. Fitzpatrick; *First Vice-president*, Dr. S. Y. Walsh; *Second Vice-president*, Dr. J. A. Morgan; *Secretary*, Dr. C. M. Scott; *Treasurer*, Dr. H. V. Dobson; *Executive Com.*, Drs. H. V. Dobson, H. M. Yelland and E. A. Hammond.

The Canadian Branch of the British Association of Dermatology and Syphilology

The Annual Meeting of the British Association of Dermatology and Syphilology (Canadian Branch), was held on June 1, 1934, at the Hamilton General Hospital, Hamilton, Ont., at which the following members were present: Drs. Marin, Burnett, McGovern, Sabetta, Poirier, and Usher, from Montreal; Drs. King-Smith, Trow, Dixon, Wrong and Ireland, from Toronto; and Drs. Jaffrey and Basil Bowman, from Hamilton. Drs. Bauckus and Arnsson, from Buffalo, were also present as guests of the Association.

At the morning session a number of interesting cases were shown, consisting of lupus vulgaris, acne conglobata, psoriasiform syphilide, psoriasis, pemphigus, neurofibromatosis, radio-dermatitis, onychomycosis, hereditary hæmorrhagic telangiectasia, ichthyosis, two cases of sycosis vulgaris, three of angioma cavernosum, five of lichen planus, and two of lupus erythematosus.

At noon, the Board of Governors of the Hamilton General Hospital gave a very delightful luncheon to the members present.

The afternoon session consisted of a discussion of the cases observed and studied in the morning, and centred predominantly upon therapy. Dr. Wrong presented an interesting and instructive paper on "Papillomatous tumours of the skin."

A short business meeting was then held at which Dr. W. R. Jaffrey, of Hamilton, was elected *President* for the coming year, and Dr. Basil Bowman, of Hamilton, was elected to membership and appointed *Secretary-treasurer*.

Dr. and Mrs. Jaffrey entertained the members and guests at a garden party on the spacious lawn of their residence in Dundas.

The annual dinner was held at 7 p.m. at the Wentworth Arms Hotel.

The next meeting will be held May 4, 1935, in Montreal.

BASIL BOWMAN,
Secretary.

Fortune is fond of change; she allows herself to be possessed, and she escapes from us. Dost thou suffer from her fickleness? Learn to bear it with patience.—Pythagoras.

The power and the riches acquired by a life of anxious toil slip not unfrequently from their possessor's hands, from defective government or mismanagement: because it is easier to acquire power and to gain wealth than to keep and use them prudently when gotten. An especial virtue is needful to this, more than is required for the gradual heaping up of riches.—Richard Pigot.

Topics of Current Interest

Recent Trends in Diabetes Mortality*

By LOUIS I. DUBLIN, PH.D.

Diabetes today presents a serious and growing public health problem. This has developed in the course of the present generation. Thirty years ago diabetes was a minor cause of death. Even if we grant the incompleteness of registration, it is perfectly clear that a relatively small number of deaths from diabetes actually occurred. Today, it is tenth in the list of causes of death. Among females, it is ninth in order of importance, and if we limit our comparison to ages 45 and over it is seventh in order of importance as a cause of death. Today, more women over 45 years of age die of diabetes than of tuberculosis. In fact, we know that from 2 to 3 per cent of our present population will ultimately die of diabetes. It is for these reasons that more and more public and medical attention must be directed to the problem of diabetes, and an organized program of control developed, as was done for tuberculosis a generation ago.

I would not, however, exaggerate the seriousness of the present diabetic situation. It is easy to overstate the case. The increase in the mortality from diabetes is altogether limited to ages 45 and over. Under age 45 there has been marked improvement in the situation, and even after 45 the increase is pronounced primarily among women. So far as men are concerned, there has been little change in the situation between ages 45 and 65, and such increase as has occurred is limited to old men. We are today concerned, therefore, with diabetes chiefly as a problem of women in middle and later life, and, secondly, as a problem of old age in men.

The discovery of insulin did bring about a new era in the treatment of diabetes. It has undoubtedly proved a marvelous remedy. This is clearly indicated by the improvement in the mortality at the younger ages where heretofore the disease was, in most instances, a death warrant. In so far as the older people are concerned, insulin has proved an effective agent in prolonging the life of the diabetic many years. But this very fact helps, in a measure, to explain the phenomenon of the increasing death rate. The extensive use of insulin has served to increase the number of cases after age 45, and in this way has helped to shift the mortality from the younger to the older.

Another point of some interest is the shift in recent years in the ratios of deaths between the two sexes. Thirty years ago all of the tabulations showed a slight excess of males over

females. Today, we find almost uniformly many more deaths among females than among males, and the death-rates after 45 are twice as high among women as among men. This is an interesting problem that calls for more intensive study.

In a very real sense there is a paradox in the present situation. There has been an undoubted improvement in the treatment of diabetes. Nevertheless, this improvement has been accompanied with an increase in the number of deaths. It is necessary to conclude, therefore, that there are today many more cases than occurred in the past. I wish it were possible to register the cases of diabetes as we have done for a long time the cases of tuberculosis, because then we should not have to guess at this increase and its extent.

This increase in the incidence of diabetes is, however, a two-fold one, partly apparent and partly real. Let us consider first what I call the apparent increase. In the first place, we are today better equipped to recognize the disease and to diagnose it early. The more extensive use of laboratories in hospitals and clinics has increased the number of cases on record. The increase in the amount of insurance carried by the population has contributed greatly in discovering many cases of diabetes. In many instances, persons have discovered that they had a diabetic condition only after they had applied for insurance and had been rejected by the company. The insurance companies have also encouraged periodic health examinations, and this has helped. But all of this improvement in medical facilities has not really added a single case to the number of diabetics. It has merely enabled us to identify more cases than was possible before, and when death occurred many of these cases were registered as deaths from diabetes, rather than from some other cause, as actually did happen in the past. The discovery of insulin itself created an intense and widespread interest in the disease. More physicians now look for the disease than ever before. In like manner, the shifts that have taken place in the age and sex composition of our population and in the racial structure of our population, have helped to bring about an increase in the number of cases.

In contrast with these items, there are a number of causes which have been at work during the last generation, which have, in a very real sense, increased the number of diabetics. The first of these social forces is the improvement in the standard of life of the population. During the last generation, there was a very appreciable improvement in the economic condition of the people. Real wages increased, and with this came an increase in the buying power of the people. On all sides the average man and woman could enjoy and did enjoy the use of more and more food and other comforts of life. At the

* An abstract of an address delivered before the New York Academy of Medicine, *Bull. N.Y. Acad. of Med.*, 1933, 9: 540.

same time, while this rise in the standard of life took place, and possibly as a concomitant of it, there was an increase in the use of machinery and a greater mechanization of industrial processes. More and more people took to industrial employment, and in such employment were called upon to a lesser and lesser degree to use their energy in the production of work. Nor was this shift from manual to mechanical labour limited to industry. It permeated the farms and the homes so that the entire population was relieved of much of the hard and heavy work which in previous generations was a part and parcel of the daily life of the people. So we are confronted with two forces, both operating to disturb the metabolic equilibrium of large numbers of persons. On the one hand, more food materials were taken in and, on the other, less energy was called for to burn it up. The net result was over-feeding, and in the long run the increase in the number of people overweight and even obese. Unfortunately, it is among such overweight and obese individuals that diabetes takes its greatest toll. In this sense the very conditions of life in the present generation have made the increase of diabetes almost inevitable.

On the whole, however, the present situation in diabetes should not cause us to despair. So far as its increasing mortality is concerned, the problem is a very circumscribed one. It is that of controlling the disease in older people, chiefly in women. To some extent the increase at these older ages need not surprise us. Insulin does not cure diabetes. It does prolong the lives of diabetics, but it does not make them immortal. The disease comes chiefly in later life, and diabetics are prone to the development of heart disease, nephritis and arteriosclerosis, just as other old persons. These diseases occur relatively early among non-diabetic persons who are overweight, and it is not surprising that diabetics, most of whom are overweight, should suffer in the same way.

On the other hand, there are many things we can do to improve this situation. There are too many premature deaths from coma. We can postpone death from cardiovascular degeneration to a much greater extent than we have succeeded in doing. There are even today large numbers of cases which are not diagnosed as early as they should be. All this calls for an aggressive plan for attack.

Blood Tests Shed Light on the Origin of Indians

Extensive blood tests carried out on Indians of British Columbia by Prof. R. Ruggles Gates, of King's College, London, and Dr. G. F. Darby, bring fresh evidence showing the close relationship of the American Indians to certain tribes

found mainly on islands of the Siberian coast, such as the Giliaks of Sakhalin.

Practically all pure-blooded American Indians of various tribes previously tested were found to belong to the blood-group O. In this they differ from Mongolian peoples on the mainland of Asia and Japan, who have a high proportion of B type.

Haida, Tsimshian, and certain other Indian tribes of British Columbia have been considered by anthropologists to be more like Mongols in appearance than other American Indians. Professor Gates and Doctor Darby now show that in blood these tribes belong practically all to group O. Out of three hundred persons tested, only two were B and 12.7 per cent A, and most of the latter were clearly of mixed origin. Thus, the Mongol-like Indians of Canada's northwest are found different in blood type from the mainland Asiatics, but like certain tribes of the Siberian coast and Sakhalin Island.

These findings support the view of the American anthropologist, Dr. Ales Hrdlicka, of the Smithsonian Institution, who has shown that various racial remnants in northern and eastern Asia and neighbouring islands resemble the Indians so strongly as to be often indistinguishable from them in appearance. Such are the Giliaks and Samoyeds.—*The Diplomat*, 1934, 6: 174.

The Doctor Prescribes Shoes

According to some independent investigations made by a leading physician in the orthopaedic field, there are listed in a shoe trade registry for 1932 a total of 189 trade names for shoes with the designation "Dr." as a part of the name. Here, obviously, is an attempt to capitalize a medical background in promoting these wares. The title "Dr" attached to the shoes would seem to indicate that they have been especially designed by a physician for certain types of foot weakness or malformation, whereas in the majority of cases the shoes were probably designed by a shoe manufacturer who then secured the consent of some unwary physician to the use of his name. Following the publicity accorded to the Canadian Mahlon Locke, the shoe sections in department stores in many parts of the country featured Mahlon Locke shoes, and advertisements in the newspapers suggested to readers the possibility of relief from arthritis by the wearing of this brand. Since every foot differs from every other one, it should be at once apparent that no shoe constructed according to a standardized type could be quite adequate for any deformed or weakened foot. The specialist in orthopaedic surgery is likely to prescribe supporting pads, braces or splints according to the conditions he finds after careful study; any other apparatus can be but a makeshift. It is to be hoped that the leaders in the boot and

shoe manufacturing industry will, in developing their code for this industry, pay special attention to this type of misleading promotion. Moreover, physicians, particularly those specializing in orthopaedics, should be aware of the manner in which their names may be misused in such a connection and avoid the possibility of having their names carried to posterity on the arches of some shoe rather than by their scientific contributions to the literature of their specialty.—*J. Am. M. Ass.*, 1933, 101: 1397.

Abstracts from Current Literature

Medicine

Observations on Dry Bronchiectasis. Wall, C. and Hoyle, J. C., *Brit. M. J.*, 1933, 1: 597.

Since the advent of lipiodol radiography the condition of "dry bronchiectasis" has been recognized. While the authors have only been able to collect 30 published cases, they now add to these 20 personally observed cases. Since these were seen within a period of only two years they suggest that this condition is probably quite common. Many of the previous cases were recognized on account of hæmoptysis; this has not been a common symptom in this series, being present in only five cases. Dry cough is the commonest symptom. Bronchopneumonia (usually following measles), whooping-cough, or influenza, during childhood or adolescence, is the commonest antecedent condition. The bronchiectasis is usually basal; abnormal physical signs, such as dullness, diminished breath sounds and crepitations, may or may not be present. The only certain means of diagnosis is by lipiodol radiography. To explain the etiology, the authors suggest that if for any reason (as from obstruction of bronchioles by exudate) the air does not enter the alveoli during inspiration, the force of the inspiratory effort is transmitted to the bronchi to which the air has access. If the mediastinum is fixed by adhesions so that it cannot move towards the side of the threatened vacuum the probability of bronchial dilatation is greater.

The two great risks in these cases are sepsis, with the development of "wet bronchiectasis", and serious hæmorrhage. None of the cases in this series has become septic during observation and only 2 of those reported in the literature. Hæmoptysis is a much greater risk, although this complication, too, is not really common. It is usually recurrent, if it occurs at all, and may seriously endanger life. Lobectomy may be considered in unilateral cases. It was not practised in any of the cases in this series. In favour of conservative treatment is a certain amount of evidence to show that the bronchi may

sometimes spontaneously revert towards their normal condition.

W. FORD CONNELL

Bronchiectasis. Roles, F. C. and Todd, G. S., *Brit. M. J.*, 1933, 2: 639.

The authors have studied, at the Brompton Chest Hospital 106 cases of bronchiectasis of all types, with a view to establishing the prognosis under the various types of treatment in vogue. The period of observation was never less than three and up to six years. Their cases are classified as "dry" when there is no expectoration, "septic" when there is purulent sputum, and, "fetid" when the sputum is copious and foul. "Simple" cases, with occasional sputum, seem to have as bad a prognosis as those which are consistently "septic". They find that bronchiectasis which receives only medical treatment is an extremely fatal disease, since, during the period of observation, of 49 cases treated thus, 23 are dead and 9 totally incapacitated. Of the remainder, only 4 were "dry" 5 years from diagnosis.

It is suggested that in order to secure early diagnosis of cases of bronchiectasis all doubtful cases of hæmorrhage and cough in which tuberculosis has been excluded by ordinary x-ray examination should again be x-rayed after lipiodol injection. It is emphasized that a lateral x-ray examination is necessary in some cases where screening shows an apparently unilobar distribution of the lipiodol.

As regards operative procedures, phrenic evulsion is found to be of doubtful value; it is not indicated where lobectomy is at all possible. It may be used when artificial pneumothorax is contemplated. Thorocoplasty is a useful operation in advanced unilateral disease and will render existence more tolerable for the patient and for his friends. It should never be contemplated when only one lobe is involved. Artificial pneumothorax now finds its chief use as a preliminary to lobectomy, a procedure which has proved to be a tremendous advance in the treatment of bronchiectasis. Lobectomy in the right hands has been shown to have an extremely low mortality (only 2 operative deaths in the last 34 cases during the past two years at the Brompton). It is of course the only radical method of cure of a localized bronchiectasis. Its use demands diagnosis with certainty at an early age and experienced attention to pre- and post-operative measures.

W. FORD CONNELL

Pathological Changes in the Carotid Sinus and their Relationship to Hypertension. Keele, C. A., *Quart. J. Med.*, 1933, 2: 213.

Since it has been shown that afferent nerves from the carotid sinus and the aortic arch play an essential part in the regulation of normal blood pressure, exercising normally a tonic inhibitory influence, it has been suggested that the putting out of action of these "buffer

nerves" in the human subject might lead to the development of hypertension. Intimal and medial thickening of the sinus, due to atheroma, might conceivably prevent the transmission of internal blood-pressure changes to the nerve endings, which would thus cease to function normally, though they might remain anatomically intact. The author has investigated the aorta, carotids and carotid sinuses of 55 consecutive cases coming to post-mortem, and in this material can find no evidence in support of such a thesis. In a good proportion of the cases, the blood pressure during life was known, and in all the weight of the heart was taken. No relationship could be established between the degree of sinns and aortic atheroma and the presence of hypertension. It was found, however, that atheroma of the carotid sinus was very frequent, usually associated with a similar degree of involvement of the aortic arch and the innominate and common iliae bifurcations and was definitely related to the age of the patient.

W. FORD CONNELL

The Sphygmomanometer in the Diagnosis of Cardiac Irregularities. Shaw, M. E., *Brit. M. J.*, 1933, 1: 957.

While the electrocardiograph has made differentiation of cardiac irregularities comparatively simple, this method is not at all times available. This article serves to emphasize the use which can be made of the sphygmomanometer as a diagnostic aid in certain types of case. It is pointed out that pulsus alternans, a very grave condition, may be of such minor degree that the examining finger on the pulse cannot detect the alternating beats; by auscultating with the cuff close to the systolic pressure the differences can be readily appreciated. Also, the audible number of beats may double suddenly as the pressure is lowered from the systolic level.

A study of the pressure relations of individual pulse beats may sometimes distinguish cases of frequent extrasystole from auricular fibrillation. In the latter, the complete disorganization of the ventricular rhythm is suggested by the fact that the sound of each beat varies with the pressure in the cuff constant. Auscultation with partially inflated cuff in a case with frequent ventricular extrasystoles will reveal that the dominant rhythm of the heart is still present, the ectopic beats having been eliminated. When, as is more rarely the case, the extrasystoles are of auricular origin, the dominant rhythm is much more seriously disturbed. In these cases, however the extrasystoles often seem to generate a fairly constant pressure, i.e., with a systolic pressure of 160 all the ectopic beats might be shown to appear at about 120. If this point can be demonstrated, the evidence is strongly against auricular fibrillation.

W. FORD CONNELL

Immune Reactions in Diabetes. Moen, J. K. and Reimann, H. A., *Arch. Int. Med.*, 1933, 51: 789.

Intercurrent infections have long been observed to have an unfavourable effect on diabetes. Joslin drew attention to the presence of infection in nearly every case of coma in the pre-insulin era. Warren remarked that, whereas arteriosclerosis threatens the diabetic patient who is doing well, infection is the chief danger of patients who are doing poorly. Many theories have been advanced to account for the decreased resistance of diabetic persons to infection. The present study was suggested by experiments on antibody formation in kala azar. Chung and Reimann showed that the formation of agglutinins was markedly retarded as compared with their development in normal persons.

The authors injected subcutaneously "triple typhoid" vaccine into 12 diabetic patients and six normal persons. Blood was obtained from each subject before each injection, and at intervals of from five to ten days thereafter for six weeks. The serum was removed, and agglutination tests were carried out. They report approximately normal agglutination responses in a group of seven patients with controlled diabetes. Two patients with uncontrolled diabetes showed distinctly subnormal responses. Three patients with severe diabetes and acidosis showed the most marked deviation from normal, with low agglutinin response to certain antigens and no response whatever to others. They also report a higher percentage of positive tuberculin reactions in 65 diabetic patients, as compared to a control group of 65 non-diabetic persons. They conclude that there is a causal relationship between the deficiency of demonstrable antibody formation and the increased susceptibility of severely ill diabetic patients to infection. They admit however that the cause of the apparent diminution of agglutinin production in uncontrolled diabetic patients is unknown.

LEYLAND J. ADAMS

A Classification of the Diseases of Lipoid Metabolism and Gaucher's Disease. Pick, L., *Am. J. M. Sc.*, 1933, 185: 453.

Professor Pick divides all xanthomatoses into two groups, depending upon whether they are generalized or localized. The former group he subdivides under two main headings. The first subgroup includes symptomatic or secondary forms, such as the xanthomata which occur in diabetes, kidney or renal disease. These lesions are usually pea- or bean-sized yellowish nodules which are flat and occur in the skin. They are particularly likely to occur on the extensor surfaces about the elbows or knees. In these lesions the lipid is deposited mainly in the connective tissue cells of the skin and in the endothelium of lymph vessels. Chemically this fatty deposit is a cholesterolin fatty acid ester. The droplets

are doubly refractile, take the Sudan stain, and are soluble in alcohol. The second subgroup of generalized xanthomatoses includes the essential or primary types. The following diseases belong in this group: Gaucher's disease; Niemann-Pick's disease; Hand-Schüller-Christian's disease; the primary non-symptomatic external and internal xanthomatoses which occur in varying distributions and intensity in the skin and in the inner organs.

The four diseases may be differentiated not only by their clinical and anatomical properties but also according to the clinical character of the deposited lipoids. The first of these, Gaucher's disease, is by no means rare, as more than 75 authentic cases have appeared in the literature. It is congenital and familial, but the disease is limited to the one generation. About twice as many females as males are affected. The disease may be noticed in the first months of life and may lead to death in infancy. The symptoms are those of rapidly progressing cachexia, though the main symptom may be cerebral, with spastic paralysis and psychic disturbances. Some cases run a chronic course. One patient lived fifty-six years.

The diagnosis from splenic anaemia, Banti's disease, familial splenomegaly, acholuric jaundice and Hanot's biliary cirrhosis can be made with certainty only by splenic puncture, which will demonstrate the characteristic Gaucher cells. These cells measure 20 to 80 microns in their largest diameter, are polymorphous, and may contain one or many pyknotic nuclei. The protoplasm is foamy, but is optically and microchemically inactive. It is probably one of the cerebroside, namely perasin. These cells occur through the body and may be found diffusely infiltrating organs as the liver, spleen and bone marrow, or may collect in groups, thus forming whitish nodules. Eventually they so interfere with the function of the organ as to cause local and finally general cell-death. Professor Pick will discuss the other diseases comprising this group of primary or essential xanthomatoses in subsequent papers.

E. S. MILLS

Primary Thrombosis of the Subclavian Vein.

Taylor, C. H. S., *Brit. M. J.*, 1933, 2: 818.

Two cases are reported of thrombosis of the subclavian vein in presumably healthy young Cambridge undergraduates, who rowed extensively. The first patient presented marked swelling of the arm, with slight cyanosis, but had no pain or pitting or tenderness on pressure. No thrombosed vein could be palpated and x-ray examination was negative. The other presented similar signs, but had considerable aching in the shoulder, and the veins over the pectoral region were dilated; the thrombosed vein could not be felt. Recovery in both cases was excellent, after some weeks. The author points out that expiratory effort, combined with

muscular strain, and abduction of the arm are usually given as explanations of this form of thrombosis. In rowing there is little abduction of the shoulder, but a good deal of shoulder play and movement at the sterno-clavicular joint. At the end of the stroke the outer end of the clavicle is pulled backwards and downwards, and this might cause pressure on the subclavian vein as it passes over the first rib. Such pinching is assisted by the pressure of the backward and downward swinging clavicle against the contracted anterior scalene muscle, combined with pressure on the vein by the contracting subclavius.

W. FORD CONNELL

Diseases Associated with Pernicious Anæmia.

Wilkinson, J. F., *Quart. J. Med.*, 1933, 2: 281.

The author has personally investigated 370 cases of proved pernicious anaemia, finding 23.2 per cent suffering from concomitant disease. He finds that in the absence of sepsis or infection the pernicious anaemia responds to treatment quite satisfactorily and in a normal manner, independently of the second condition. The associated diseases, of course, require their own specific treatments in addition to the pernicious anaemia therapy. When sepsis or infection is present, satisfactory treatment of the anaemia can only be secured upon removal of the complicating infection (cystitis, pneumonia, etc.).

No definite common factor between pernicious anaemia and the various conditions occurring coincidentally with it can be proved. Some skin diseases very commonly associated with gastric dysfunction, and certain gastrointestinal symptoms, as glossitis, flatulence and diarrhoea, are frequently found in cases of pernicious anaemia—such symptoms being relieved by the anaemia therapy. The author concludes that most of the disease associations found are quite fortuitous happenings; in many cases, their incidence amongst people free from Addisonian anaemia is higher than that found in this series—where 77 per cent of the cases showed no complications whatever.

W. FORD CONNELL

Twins as Biological Controls in the Study of Human Constitution. An Additional Approach to the Study of Clinical Medicine. Margolis, H. M. and Eisenstein, V. W., *Ann. Int. Med.*, 1933, 6: 1489.

From their study of the cases reported in the literature of diseases affecting identical twins the authors conclude that it is probable that all disease is influenced by the constitutional predisposition or resistance to such disease. They believe that too great a rôle has been assigned to the purely external causes of disease and not enough to the vital intrinsic mechanism. It would appear that some sort of inherent defect is inborn, which develops only under the influence of some adequate environmental stimulus or stress. Disease is seen not as a capricious

event but as a necessary sequence. In a study of twins, many of whom lived in widely separated parts of the world, one has the benefit of "biological controls". The diseases found to have affected identical twins late in life fall into four groups: (1) neoplastic; (2) nervous and mental; (3) non-infectious; (4) infectious. The authors mention the case of twin sisters, both of whom, at the age of 21 developed fibroadenomas, not only of the same breast but of the same part of the same breast. Each of twin brothers developed small round-cell sarcoma of the right testicle within a few years of the other. Each of twin sisters developed retinoblastoma of the left eye within 7 months of the other.

By far the bulk of reports upon the diseases of identical twins concerns their identical nervous and mental afflictions. There was not a single instance in which dementia præcox occurred in only one twin.

The case is reported of twin brothers, both obese, who at the age of 60 simultaneously developed diabetes, later leg paræsthesias, perforating ulcers of the toes, and great psychotic excitement. They died within a few months of each other of uræmia. Twin brothers at the age of 56 developed chronic lymphatic leukaemia almost simultaneously. The disease followed a similar course in each, and the brothers died within 68 days of each other.

Among other medical conditions observed simultaneously in identical twins have been nephritis, renal tuberculosis, bronchial asthma, bronchiectasis, psoriasis, cataract, pituitary anomalies, polyarthritis, Hodgkin's disease and Von Jaksch's anaemia. Such occurrences point unmistakably to a defect in the constitutional structure in each of the two individuals.

H. GODFREY BIRD

Myeloid Insufficiency. Gottlieb, R., *Ann. Int. Med.*, 1934, 7: 895.

The author suggests that the insufficiency of the myeloid system in the related conditions of aplastic anaemia and agranulocytosis may be due to the action of a hypothetical toxin, not on the bone marrow directly, but, indirectly, through stimulation and proliferation of the reticulo-endothelial system. He points out that this system exercises a physiological inhibitory action on the bone marrow, keeping in check its normal tendency to proliferate, and calls attention to the fact that increase of this inhibitory action occurs in typhoid fever, influenza, and in other conditions in which leucopenia, anaemia and purpura are common. It is suggested that complete atrophy of the bone marrow may result from a pathological increase of this inhibitory action, and its persistence after the original cause has been removed.

A case of complete myeloid insufficiency of unknown cause is presented. Following splen-

ectomy, improvement was almost instantaneous. The blood picture quickly became hyperregenerative in character, and the patient left the hospital, three weeks after the operation, perfectly well. A mild reticulocytosis occurred. The red count rose from 1.7 million before operation, to 4.3 million six weeks afterwards. In the same period the white cells increased from 2,000 to 6,400, and the platelets from 40,000 to about 150,000. Unfortunately, about this time the patient developed a cold and began to go down hill rapidly. He died of broncho-pneumonia four weeks later.

The author suggests that splenectomy, if done early, by removing a large part of the reticulo-endothelial system, may be expected to prolong life, at least until compensatory proliferation takes place. Operation should be decided upon only if biopsy shows some active marrow is still present, if the adrenalin test gives a favourable response, and in the absence of infection.

H. GODFREY BIRD

An Overlooked Factor in Susceptibility to the Common Cold. Ewens, A. E., *West Virginia M. J.*, 1933, 29: 1.

This article is a plea that greater attention should be paid to the uvula as a factor in the causation of coughs and "colds". In the absence of a known bacterial cause, or causes, for these common and troublesome affections and the improbability that serological treatment would be of avail even if the bacterial cause were known, it is not beside the mark to transfer attention to structural abnormalities of the nose and throat, which, conceivably, may tend to lessen resistance to catarrhal infections. Acting on this idea, the author has found that the routine employment of staphylectomy, or removal of the uvula, for the treatment of habitual clearing of the throat and paroxysmal cough has been beneficial, and, a rather amazing fact, has also exercised a remedial influence upon catarrhal conditions of the entire upper respiratory tract. After following up his cases the author has come to the conclusion that staphylectomy checks susceptibility to "colds" in more than 50 per cent. The beneficial results from this operation are seen, objectively, in the reduction of chronic post-nasal engorgement to a degree that definitely facilitates nasal breathing, and the characteristic signs and symptoms of pharyngeal and naso-pharyngeal catarrh are rendered permanently less pronounced.

A. G. NICHOLLS

Surgery

Prognosis in Carcinoma of the Stomach. Ashurst, A. P. C. and Klopp, J. W., *Arch. Surg.*, 1933, 27: 320.

The stomach is the most common site of human cancer. A study of statistics shows that there is an unmistakable increase in the incidence of

this disease, especially among males. Most of the 54 patients whose records are reviewed were in the sixth (18) and seventh (18) decades of life, at the time of treatment. There were 2 in the third decade of life, 4 in the fourth, 8 in the fifth and 4 in the eighth. The youngest was twenty-seven years of age. The average age was about fifty-six years.

There are three groups according to the type of classical symptoms from which they suffer: (1) those with a short history (*i.e.*, up to six months); (2) those with a long history (over six months); and (3) those with no history of the dyspepsia syndrome. About 50 to 60 per cent were in group 1, 35 in group 2, and 2 to 18 per cent in group 3.

Indigestion and lack of appetite, especially for meats, and loss of strength and weight, were first complained of, rather than pain. Pain and tenderness were later features. Vomiting depends on whether there is pyloric obstruction. Three patients in group 3 without the dyspepsia syndrome suffered from weakness and anæmia, cardiac disturbances, fever and sweating, or from neuralgia due to bone metastasis.

Twelve of the authors' patients were not operated on; 3 refused operation and 9 were far advanced cases. Surgical removal of the lesion offers the only hope, and the patient must be in that class which lends itself to operation. Out of a series of 54, only 6 were observed early enough for radical operation. Four of these survived the operation for seven years or longer. Exploratory operation was always urged when it was thought the patient would survive. Sixteen exploratory operations were performed, with a mortality rate of 43.7 per cent, and all patients who survived, except one, died in less than five months.

The general mortality in palliative operations was 35 per cent. The known history of 11 of the 13 patients operated on showed that they lived in comfort for from three to fourteen months. The authors believe that palliative operations are worth doing, in spite of the high early mortality.

G. E. LEARMONTH

The Curling Ulcer. McLaughlin, C. W., *Arch. Surg.*, 1933, 27: 490.

To C. B. Curling, of London, is given the credit for first describing, in 1842, the association of superficial burns with intestinal ulceration. These ulcers are more common in young girls, are twice as frequent in women as in men, and occur most frequently with burns on the trunk.

No adequate explanation has as yet been given as to the etiology. Though Curling believed that the ulcers occurred only in the duodenum, yet they have been found in various parts of the stomach and small intestine. Commonly, the ulcer occurs in the duodenum above the ampulla of Vater, and, as Moynihan states, 75 per cent

are in the first portion of the duodenum. Single or multiple ulcers appear on an average of six to twelve days after the burn. They tend rapidly to hæmorrhage, perforation or healing. There is only a slight tendency to chronicity. A diagnosis of ulcer is rarely made during life. Moynihan did not find any cases on record where treatment had been successful of perforated Curling's ulcer.

In recent years the association of superficial burns with the occurrence of damage to the adrenal glands has been noted. Experimentally it has been found that following superficial burns there has been a rise in the blood sugar, the height and rapidity of the rise being dependent on the severity of the burn. Suprarenal destruction occurred in those animals living over twenty-four hours, and an associated suprarenal hypofunction leading to a high glycogen content of the liver. In the experiments carried out by the author the suprarenal glands showed a varying degree of destruction, with fibrosis and regeneration occurring in some sections. The suprarenal glands play an important part in the balanced relationship existing between the sympathetic and parasympathetic nervous systems. McLaughlin noted in a series of 21 dogs that 17 showed definite ulceration in the small bowel following bilateral suprarenal cauterization. In no case was ulceration seen proximal to the pyloric ring.

G. E. LEARMONTH

Treatment of Pulsating Exophthalmos. Hamby, W. B. and Gardner, W. J., *Arch. Surg.*, 1933, 27: 676.

Pulsating exophthalmos, or retrobulbar arteriovenous aneurysm, is a relatively rare condition.

The history of such a lesion is fairly typical. Following trauma resulting in a period of unconsciousness, the patient has failure of vision or blindness in one eye, unilateral exophthalmos and a rushing, roaring sound in the head synchronous with the pulse. Palpation of the eye discloses a thrill, and auscultation, a bruit synchronous with the pulse. The lesion usually is progressive. At autopsy, an opening is found in the internal carotid artery in its course through the cavernous sinus. The usual method of treatment has been to ligate the artery involved, either abruptly or gradually. Sudden ligation of the internal carotid artery is frequently followed by hemiplegia. The principles of treatment are (1) the Hunterian, involving the ligation of the affected artery proximal to the rupture. This method has proved inadequate. (2) Ligation of the artery both proximal and distal to the aneurysm, which may be beneficial when there are few collateral channels, but otherwise is unsatisfactory. (3) Ligation of all the arteries and veins involved in the lesion may be of value in treating arteriovenous aneurysm, but not in the treatment of pulsating exophthalmos. (4) Direct closure of the fistula. This

is rarely feasible. Brooks has devised a method of occlusion which has been adopted with apparent success. He opened the internal carotid artery in the neck between clamps and packed long, thin strips of muscle into the artery. The incision in the artery was closed and the clamps removed. The blood stream forced the muscle into the fistula, effectually plugging it. The eye in Brooks' patient was later lost from thrombosis. Following Brooks' technique the authors used a smaller muscle embolus. This principle is rather radical. The embolus is propelled by a force equal to the systolic blood pressure. Two forces act upon it at the fistula; (1) at the point of division it may go into the cerebral circulation against a pressure equal to diastolic blood pressure or 80 mm. of mercury, or it may go into the fistula where the pressure is very much lower. Taking the course of least resistance the embolus enters the fistula. The combined effect of the embolus and resulting thrombosis closed the opening. The authors report two successful cases, in one of which the method of Brooks together with the ligation of the right common and internal carotid arteries; in the other instance the method of Brooks was unsuccessful, but the ligation of the right common, the internal and the external carotid arteries proved satisfactory.

G. E. LEARMONTH

Pylephlebitis. Koster, H. and Kasman, L. P. *Arch. Surg.*, 1933, 27: 910.

Although pylephlebitis is comparatively uncommon, yet the high mortality rate makes it a formidable complication of acute intra-abdominal disease.

The authors report the records of 4 fatal cases of pylephlebitis; 3 were found as complications of 1,027 cases of acute appendicitis and 1 in 112 cases of acute cholecystitis. A full post-mortem report of each case is given.

Pylephlebitis is not synonymous with abscess of the liver, as the latter is almost always the sequel of the former. The abscess may arise through the portal veins, the hepatic artery, or the bile ducts, and, possibly, the lymphatics. Both pylephlebitis and liver abscesses can occur only when the infection travels by way of the portal vein. With extension of a septic process from the veins of the appendix, a single abscess may develop which is usually located in the right lobe of the liver.

The chief single cause of pylephlebitis is suppurative appendicitis. Chills and a rapid rise in temperature occurring in the progress of an acute inflammation of any organ in the abdominal cavity must always be considered significant of entrance of septic material into the general circulation, after it passes through the liver. A profuse perspiration frequently accompanies the chill.

Pain over the liver may or may not be present. It is of a dull character when present,

is in the upper right quadrant, and may extend to the shoulder blades. The leucocyte count is not of much diagnostic significance. Tenderness is nearly always present and may frequently be found over the portal vein.

Jaundice is usually evident, and is one of the early signs of liver involvement and should arouse suspicion of a complicating pylephlebitis, when following an appendicectomy operation. In all of the authors' cases there was an enlargement of the spleen. Blood examinations for microorganisms are usually negative, as the *B. coli*, the causative factor, rarely enters the blood stream, and if it does is quickly destroyed there.

The treatment of pylephlebitis is primarily prophylactic. There would be fewer instances of this complication if patients were operated on earlier. At operation, if the surgeon notices that in cutting the meso-appendix there is no bleeding, because of thrombosis of the appendiceal vein, he should consider such a case as one in which pylephlebitis may develop. Ligation or excision of the ileo-colic vein is indicated when a frank suppurative phlebitis of the mesentery is evident, and should be done before performing the appendicectomy.

G. E. LEARMONTH

Obstetrics and Gynæcology

Bacteriological Findings in the Uterus during Labour and the Early Puerperium. Douglas, R. G. and Rhees, H. S., *Am. J. Obst. & Gyn.*, 1934, 27: 203.

In 171 consecutive uterine cultures taken during the puerperium, averaging 3.2 days following delivery, the organisms found most frequently were anaerobic streptococci. These organisms, together with the facultative aerobic streptococci, were present in 73.6 per cent of all patients studied. The examination of the cultures revealed the presence of anaerobic gas bacilli in the puerperal uterus following operative deliveries in 6 instances, an incidence of 3.5 per cent. In one other patient this organism was found to be present in the uterus during labour. The incidence of the colon bacillus in the uterine cultures was 8.7 per cent. This bacillus was found in the uterus almost three times more frequently in operative than in spontaneous deliveries. In the non-operative patients, in whom the colon bacillus was found in the uterus, there was almost always an accompanying colon bacillus infection in the urinary tract.

S. aureus was found to be present in only one post-partum uterine culture, an incidence of 0.5 per cent. In 6.4 per cent of the uterine cultures anaerobic Gram-negative bacilli were found. All patients on whom Cesarean section was performed, and who afterwards showed positive uterine cultures at the time of operation, later developed febrile puerperia. In no instance of the 191 uterine cultures studied was the aerobic

beta hemolytic streptococcus found. During the period in which these bacteriological studies were conducted there were 1,550 full-term and premature deliveries on the service, with no maternal death from infection. ROSS MITCHELL

A Surgical Consideration of Appendicitis in Pregnancy. Maes, U., *Am. J. Obst. & Gyn.*, 1934, 27: 214.

Appendicitis is a possible complication of pregnancy which is particularly likely to recur if there has been a history of previous attacks, and which is increasingly serious as pregnancy advances. The pathological condition is probably no more serious than in the non-pregnant state, but it is aggravated by delay, and because of anatomical and physiological considerations it may quickly exhibit severe and fatal manifestations in the absence of prompt surgical treatment. Abortion increases the mother's risk, but it occurs because of the disease and not because of the surgery instituted to relieve it. The fetal mortality is inevitably high. The maternal mortality is entirely in proportion to the stage of gestation and the severity of the disease; in the mild variety it is little higher than in the non-pregnant state. Diagnosis late in pregnancy is complicated by the various factors which pregnancy introduces, and is almost entirely a clinical matter. Pyelitis offers the chief difficulty in differential diagnosis. Prompt operation is indicated as soon as the diagnosis is made, or reasonably suspected, and the procedure should be conducted throughout on the basis of sound surgical principles. Delivery should be according to obstetric indications. The proper precautions during the immediate post-operative period may serve to prevent abortion or premature labour.

ROSS MITCHELL

Endometriosis Vesicæ. Phillips, R., *J. Obst. & Gyn. of Brit. Emp.*, 1934, 41: 165.

Endometriosis is a condition in which heterotopically placed endometrium forms tumours which respond to the ordinary menstrual cycle along with the endometrium of the uterus. These tumours may occur on the ovary, tube, peritoneum, a laparotomy scar, rectum, the pouch of Douglas or the bladder.

The number of cases reported is very small. The case described is one of 29 reported cases in which the main symptoms were dysuria and hæmaturia, occurring at first only during menstruation, but later become more constant. On cystoscopic examination "blue-black cysts" with oedema may be seen.

Many theories have been put forward to explain the origin of these tumours. These include Sampson's theory of retrograde, or reverse, menstruation, when fragments of endometrium are forced through the tubes and grow on the

ovary or peritoneum; and that of embryonic inclusions, of Cullen.

Two methods of treatment are advocated: (1) the destruction of the ovaries by x-ray or radium in extensive endometriosis or in patients approaching the menopause; and (2) the removal of the tumour by complete excision, in a patient desirous of having more children.

ELEANOR PERCIVAL

Ophthalmology

Argyll-Robertson Pupil. McAndrews, L. F., *Arch. Ophth.*, 1933, 10: 520.

The observation which made Argyll-Robertson's name famous was published in 1869 in the *Edinburgh Medical Journal*. According to Wilbrand and Saenger, a true Argyll-Robertson pupil must have the following characteristics. There must be loss of direct and indirect light reaction. The convergence reaction must be increased and sustained. The pupillary diameter should be less than 3 mm. The size of the pupil does not vary from time to time. The psychic and sensory pupillary play is lost or lessened. It must be admitted at the outset that many writers on this subject do not subscribe to this definition of a true Argyll-Robertson pupil, the question of miosis being the point of disagreement. Wilson stated that miosis is incidental and not a necessary feature of an Argyll-Robertson pupil. On the other hand, with equal assurance, Behr, Lafon, Wilbrand, and Saenger and many others asserted that miosis is as important as the loss of the light reaction. This is an important observation, because on it depends whether the pupil is a true syphilitic or a false or non-syphilitic Argyll-Robertson pupil.

From a study of the literature and an examination of numerous cases of so-called non-syphilitic Argyll-Robertson pupils, one can safely say that a real Argyll-Robertson pupil is always a sign of syphilis until it is proved otherwise. If one holds that the true Argyll-Robertson pupil has certain definite characteristics besides the loss of the light reaction, many cases can be excluded because they do not come under the classification of a real Argyll-Robertson pupil. Most writers hold that a real Argyll-Robertson pupil has certain definite features besides the absence of the light reflex, and agree with Bumke and Behr that such a pupil is always a sign of syphilis of the central nervous system. At the present time the majority of authors admit that the site of the lesion cannot be positively localized. The weight of evidence would seem to indicate that the lesion is in the vicinity of the ocular motor nuclei. The fact that the extrinsic muscles are often involved at the same time makes this supposition more plausible. The theory of Behr, that the lesion is in the connecting neuron which runs from the afferent pupillomotor fibres to the sphincter

nuclens, is accepted by the majority of students and writers on this subject. S. HANFORD MCKEE

Exophthalmos in Leukæmia. Reese, A. B. and Guy, L., *Am. J. Ophth.*, 1933, 16: 718.

In the cases of leukæmia that are seen by the ophthalmologist the commonest manifestations are retinal and conjunctival hæmorrhages, puffiness of the eyelids, and a pale milky appearance of the fundus and its blood vessels. In 149 cases of definitely established leukæmia (29 acute myelogenous, 64 chronic myelogenous, 24 acute lymphatic, and 32 chronic lymphatic), of which only a small number were examined by an ophthalmologist, retinal hæmorrhages were noted in 9.3 per cent, conjunctival hæmorrhages in 4.7 per cent, and puffiness of the eyelids in 2.5 per cent. A less common manifestation is exophthalmos. In lymphatic leukæmia, the records of 96 cases show that exophthalmos was present in 2 per cent and many similar cases are reported in the literature. In myelogenous leukæmia, on the contrary, exophthalmos did not occur in a series of 133 cases, and there is no mention of it in the literature.

In the case reported exophthalmos was the first manifestation of the disease which prompted the patient to seek medical attention—a man of 69 years who reported because his left eye was red and had become progressively swollen during the month past. He had lost ten pounds in weight, and physically felt much below par. There were no symptoms referable to the right eye.

In cases of lymphatic leukæmia there is hyperplasia at the sites where lymphoid tissue is normally found. In the region of the eye lymphoid tissue is present only under the conjunctiva and in the lachrymal gland. Examination of the case here reported gave the impression that the infiltration of the orbit was confined to the anterior portion, immediately contiguous to the conjunctiva and lachrymal gland. In fact the striking feature in this case was not the exophthalmos but rather the protruding bulbar conjunctiva and injury to the lids. It was this point that suggested lymphatic leukæmia as the etiological factor in the exophthalmos. It is highly probable in this case that the mild exophthalmos was due not to a pushing forward of the globe, but to an outward pull caused by a shifting, en masse, of its anterior adnexa.

Hæmorrhages in any part of the body form a well known part of the picture of myelogenous leukæmia. In addition to a tendency of the blood elements to break through the limits of the blood vessel walls, there is also an increase in the blood-clotting time. It is not surprising therefore, although exceedingly rare, to encounter in this disease orbital hæmorrhage with exophthalmos and choroidal hæmorrhage with retinal detachment. S. HANFORD MCKEE

Sarcoma of the Choroid. Annen, E., *Ann. d'Ocul.*, 1933, 170: 651.

We may classify macroscopically sarcomas of the choroid into three groups: melanosarcoma pure; leucosarcoma pure; mixed forms. The mixed forms are by far the most frequent.

The reputation for the greatest malignancy of pure melanosarcoma is well established; nevertheless in other forms one finds as many, if not more, cases which have been perforated or caused metastases; on the other hand malignancy is not related to pigmentation.

Tumours of the choroid do not invade as a rule the sclera; their structure follows the choroidal vessels and chooses the line of least resistance of the ocular globe. Detachment of the retina is of less importance than the size of the tumour; a small sarcoma may cause a partial detachment and vice versa. Spontaneous detachments of the retina may give with the ophthalmoscope the appearance of a tumour, particularly in the case of cysts or post-hæmorrhagic deposits. S. HANFORD MCKEE

Pathology and Experimental Medicine

Relationship Between Renal Histology and the Clinical Picture in Nephritis. Gray, J., *Brit. M. J.*, 1933, 2: 1165.

The author accepts, with reservations, the filtration-reabsorption theory of Cushing, since it seems to accord fairly with both pathological and physiological considerations. While all the kidney structures are affected in nephritis, the author considers that the glomerular changes are at all stages the most important. The histological changes in the glomeruli in acute and sub-acute nephritis are such that less blood than normal can circulate through a given tuft in a certain time, while the filtration must be less selective. Albuminuria is accounted for by exudation of protein from the blood stream, through the inflamed and hyperpermeable glomeruli, while hæmaturia also occurs by leakage from this site. Some hyaline casts represent coagulated exudate from glomerular capillaries; the tubules however are undoubtedly quite prominent in the formation of casts of all types. Oliguria may be accounted for by diminished total filtration, with a normal degree of tubular reabsorption. Extrarenal factors are probably in part concerned with the causation of marked œdema, especially increased capillary permeability.

The author cannot explain high blood pressure in nephritis. To say that it is compensatory for the diminished glomerular filtration is begging the question, as it evades the real problem as to how the hypertension is initiated. With few exceptions, it is present in all cases of renal disease with some insufficiency, and is absent when there is no insufficiency. The exceptions

include some cases of waxy disease, polycystic kidney, prostate cases, bilateral cortical necrosis, etc. Perhaps extraneous factors—debility in waxy disease, vascular paresis in symmetrical cortical necrosis—have cancelled in such cases a tendency to hypertension inherent in renal insufficiency.

In chronic nephritis, the glomerular changes are again most important; when most of the glomeruli have been destroyed there is inadequate filtration and uræmia. Any surviving glomeruli are not acutely inflamed; hence there is no increased permeability and little albuminuria. Whether total filtration is normal or reduced, it is coming from a smaller number of glomeruli than normal and must flow more quickly down fewer tubules; hence there is lessened reabsorption and therefore polyuria, with low specific gravity.

In "nephrotic" cases, the marked permeability of the glomeruli is a constant feature—hence copious albuminuria. The large numbers of permeable glomeruli explain the absence of renal insufficiency, hypertension and uræmia. The author is of the opinion that tubular damage must amount to a widespread necrosis before renal insufficiency will occur from this cause.

W. FORD CONNELL

Acute Rheumatism as a Familial Disease.

Irvine-Jones, E., *Am. J. Dis. Child.*, 1933, 45: 1184.

A group of rheumatic cases was studied in Toronto and a second group in St. Louis. Control groups were studied also. The studies showed that rheumatism tends to attack more than one member of a family, and that not infrequently the attacks are simultaneous, which might confirm the opinion that rheumatism was due solely to the action of a specific infective agent. However, the rest of the evidence was against such a view, for it was shown that rheumatism was far more common in the distant relatives of the patient than it was in the control groups. It affected both members of two pairs of identical twins, but one only of two pairs of dissimilar twins. This again indicates that a constitutional factor is involved as well as the infectious agent. The disease tended to occur more frequently in blond, especially red-haired persons, also in those with blue or hazel eyes. The relatives of the rheumatic patients also tended to show a higher percentage of blonds and red-heads than did the control groups; so that the colouring was not the cause of the rheumatism, but indicated that there was a type constitutionally disposed toward rheumatism, and that this is the blond, red-haired variety.

The rheumatic group was strikingly susceptible to other infections as well, and this must be taken into account when the etiology of rheumatism is discussed. It would seem that the

undoubted familial occurrence of rheumatism was due less to a specific and contagious agent than it was to a group of certain familial characteristics which favour the onset of many infectious diseases, and especially a syndrome known as rheumatism. The determining agent may not be specific, since other acute infections of a different nature may arise simultaneously with rheumatic infections. Simultaneous attacks of rheumatism in members of a family would be explained by some non-specific but infective agent attacking several persons of "rheumatic" constitution at the same time. This is in keeping with the growing opinion of bacteriologists that rheumatism is a specialized type of reaction to a common infective agent.

MADGE THURLOW MACKLIN

The Familial Incidence of Peptic Ulcer.

Riecker, H. H., *Ann. Int. Med.*, 1933, 7: 732.

This paper discusses the familial incidence of peptic ulcer, and states that this aspect of the question has received little recognition in American medical literature. Many authors, mostly German, are quoted to support the statement that there is an inherited factor at the basis of the appearance of peptic ulcer. Spiegel's paper is quoted in which in 121 ulcer patients, other members of the family were affected in 26.4 per cent, as opposed to only 5.5 per cent with a family history of ulcer among 200 control cases. There was a history of cancer of the stomach in 14.8 per cent of the cases of ulcer, as against 2.5 per cent of the cases where there was no ulcer.

In Riecker's study there were 942 cases of duodenal ulcer. There was a history of other members affected with ulcer, or with cancer, or with both, in 13 per cent. If the whole series was considered, there was an incidence of cancer of the stomach in 2 per cent, an incidence about equal to that of the general population according to Spiegel's figures just quoted. But if the 121 cases were chosen who had given a history of other members of the family being affected besides themselves, then the incidence of gastric carcinoma rose to 30 per cent. Some workers consider that there is a definite body-build of the asthenic type, that is rather neurotic, which is characteristic of the ulcer group. The body-build is of course inherited. Others deny that there is any evidence that body-build and ulcer show correlation, although admitting that ulcers are hereditary in origin. Some hold that the gastric hypersecretion is not the cause of the ulcer, but merely the expression of a nervous or, rather, neurogenic, factor which is the basis of the ulceration, and that hypersecretion is secondary. Not all ulcer cases give a family history of ulcer. That does not necessarily exclude them from the category of hereditary ulcer; they

may have been the only ones affected. Such studies emphasize the fact that the constitution of the patient is the most important thing in the etiology of this disease: and that once a member of a family has shown peptic ulcer others should be watched for a development of the same condition.

MADGE THURLOW MACKLIN

Experimental and Clinical Studies in the Surgical Treatment of Angina Pectoris. White, J. C., *Ann. Int. Med.*, 1933, 7: 229.

The effect of section of various groups of afferent cardiac nerves on artificially induced cardiac pain has been studied. Arrest of the flow of blood in the descending branch of the left coronary artery of a dog from 15 to 30 seconds was found to produce uniform and definite signs of discomfort. It appears from this work, as well as from clinical studies, that pain from the heart and the ascending arch of the aorta is conveyed to the sympathetic trunk by fibres running in: (a) the middle and inferior cardiac nerves to the corresponding cervical ganglia, and (b) nerves which run directly across the mediastinum from the posterior cardiac plexus to the upper five thoracic sympathetic ganglia. The painful stimuli thence enter the spinal nerves through the white communicant rami. As there are no white rami in the cervical region, all pain sensation referred over the cervical sympathetic trunk must descend to the upper thoracic ganglia before it can reach the spinal cord. Pain referred to the left or right precordium or the arm enters the cord only on the same side. The vagus nerve carries no important fibres from the heart.

The upper thoracic sympathetic ganglia or their communicant rami or the posterior roots of the corresponding spinal nerves are the logical points at which to interrupt painful stimuli from the heart. The sympathetic rami and ganglia were blocked with alcohol in 28 cases of severe angina pectoris. Of these, 57 per cent were entirely relieved of their attacks on the injected side; another 23 per cent were greatly benefited; and only 11 per cent were failures. No serious complications resulted from these injections, but a varying degree of alcoholic neuritis of the intercostal nerves is a frequent and at times annoying complaint after injection therapy. White plans to employ alcohol injection on patients with angina pectoris who fail to obtain relief from medical measures. In the small percentage of cases which fail to obtain relief from alcohol injection the resulting fibrosis will make ganglionectomy a difficult procedure, but it will in no way interfere with the subsequent sectioning of the posterior roots in suitable cases.

FRANK A. TURNBULL

Therapeutics

Observations on Addisin in Diseases of the Blood. Morris, R. S., Rich, M. L., Schiff, L., Foulger, J. H. and Felson, H., *Ann. Int. Med.*, 1933, 6: 1535.

Addisin is the name proposed by the authors for the hæmopoietic hormone obtainable from human gastric juice and from the gastric contents of swine. One unit is that amount of concentrate recovered from 100 c.c. of original juice or contents. Addisin was found very much more effective when administered in a single dose than in repeated small doses. It is thought that following the intramuscular injection of a large dose, the greater part may be transported to the liver for storage, although proof of this is lacking.

Pernicious anemia.—In one case the intramuscular injection of 30 units of addisin resulted in a prompt reticulocytosis of 24 hours' duration, accompanied by a blood crisis during the first 12 days. In 115 days without further treatment the red cell count rose from 1.4 to 4.5 million, and the hæmoglobin from 47 to 93 per cent.

Erythraemia (polycythæmia vera).—Theoretically, most of the changes observed in this disease might result from hypersecretion of addisin. The authors refer to a patient who, in June, 1930, began gastric lavage and aspiration three or four evenings a week. He continued to do this until the following December by which time his red count had fallen from 10.0 million to 5.3 million. The lavage was discontinued, and the count rose within the next few months to 10.2 million.

Acholic jaundice.—The reticulocytosis which is seen temporarily in pernicious anemia in response to liver, ventriculin and addisin, and in spontaneous remissions, is permanent in acholic jaundice. In the former there is failure both in the production and maturation of the red cells; in the latter, lack of normal maturation may be the important factor. At any rate, the authors found in a case of acholic jaundice that following the injection of 30 units of addisin the percentage of reticulocytes fell to half at the end of five days, and stayed relatively low for the next six days before rising again.

Agranulocytic angina.—A patient, aged 21; temperature 103°; red blood cells 6.7 million; white blood cells 1,400; polymorphonuclear neutrophils, 7 per cent. No other granulocytes. Thirty units of addisin were given. In less than 24 hours there was an increase in the granulocytes, and myelocytes were soon found in appreciable quantity. Clinical improvement was rapid. The temperature fell to normal in two and a half days and stayed normal. At the end of six days the white blood cell was 10,900.

H. GODFREY BIRD

The Serum Treatment of Hæmolytic Streptococcus Pneumonia. Amoss, H. L. and Craven, E. B., *J. Clin. Invest.*, 1933, 12: 885.

The specific treatment of lobar pneumonia has been a moot subject for many years. At the present time the authoritative consensus seems to be that serum is effective only when administered *early* to pneumonias caused by certain strains of the pneumococcus. The present review deals with an attempt to discover the value of polyvalent anti-streptococcus serum in the treatment of lobular pneumonia. In the past we have had to rely wholly upon symptomatic measures in the treatment of this serious disease. Amoss and Craven now offer evidence that serum in streptococcus pneumonia may be utilized with some hopes of reducing the mortality rate in lobular pneumonia.

The present report, which has been carefully and critically put together, presents the results of treatment in 8 consecutive cases of lobular pneumonia. The patients showed all varieties of severity of the disease.

It is difficult to evaluate the significance of the results in the series reported, because of two factors. First, there is no control group, or group which had been treated without streptococcus serum, and, secondly, there are too few cases of streptococcus pneumonia treated upon which to pass a final opinion. Several observations in this work should be emphasized, however. It is quite unusual to have 8 successive cases of lobular pneumonia survive, particularly cases of some severity. It is even more unusual to have patients with streptococæmia survive the incidence of pneumonia, and 4 in this series did so. Also, all who developed empyema survived, an outcome quite exceptional for streptococcus empyema. Finally, it might be urged that polyvalent streptococcus serum should be given a more extensive trial especially in the more severe cases with septicæmia, which ordinarily show a high mortality.

Polyvalent antistreptococcus hæmolyticus serum (unconcentrated) and its concentrated product (erysipelas antitoxin) prepared by H. K. Mulford Co., using 9 selected strains, was the substance used. J. FEIGENBAUM

Treatment of Decubitus with Tannic Acid.

Latimer, E. O., *J. Am. M. Ass.*, 1934, 102: 751.

The older treatments of decubitus or "pressure sore" are briefly reviewed. Being struck with the similarity of decubitus to burns, the author tried numerous cases on tannic acid treatment, following the technique outlined by Davidson in 1925. A fresh 5 per cent aqueous solution of tannic acid was sprayed on the lesion every hour. The tissues were first cleared of débris and any bullæ present were opened. Deep and superficial lesions were treated, all with good results. A mild infection in the wound is no contraindication to the use of the treatment, but

a virulent infection or involvement of bone are contraindications which must be heeded.

NORMAN M. WRONG

Oto-Rhino-Laryngology

Carcinoma of the Œsophagus Treated by Radiation. Cleminson, F. J. and Monkhouse, J. P., *J. Laryn. & Otol.*, 1934, 49: 313.

An analysis of 89 cases of carcinoma of the œsophagus treated with radium is presented in this article. In 72 of these cases a biopsy showed 70, to be squamous-celled, 1 a spheroidal-celled carcinoma, and 1 a myeloma. The treatment was, first, œsophagoscopy for diagnosis, with removal of a fragment for diagnosis; next, an x-ray examination, to determine the length of the stricture; finally, a second œsophagoscopy was performed and the radon placed in position and left for seven days. The radon seeds were attached to a Souttar's tube. The dose was 5 millicuries to the inch or (2 millicuries per centimetre) screened by 0.5 mm. of platinum with intervals of from two to three months between each application. Gastrostomy was avoided if possible, and most of the patients were able to swallow up to the time of death and a preliminary gastrostomy was not found to lengthen life in those few cases in which it was performed. In a fair percentage of cases the ulceration disappeared after treatment, leaving either a stricture with smooth walls or, in a few cases, no sign at all. Post-mortem examinations in 28 of the cases showed columns of cancer cells in the lymphatics between the muscle bundles of the œsophagus above and below the former site of the growth, and in cases in which the stricture had persisted cancer cells were seen at the level of the actual site.

The survival period has been taken as the time between the moment the patient sought advice in the outpatient department and his death. The average survival period for the whole series was 5.6 months. The 79 males lived 5.2 months and the 10 females lived 8.5 months. The average length of history of dysphagia in the females was 5.4 months and in the males 3.8 months. If the patients are grouped according to their length of history those with the longest history are found to have the longest survival period. The authors conclude that the average patient does not seek advice until peripheral extension and early metastases have made it impossible for radiation to reach the outlying parts of the growth with destructive strength. They also incline to the belief that with radium treatment there may even be a danger of stimulating the rate of growth at the periphery. GUY H. FISK

Atrophic Rhinitis. Adam, J., *J. Laryn. & Otol.*, 1934, 49: 375.

This is an analysis of the author's experience in treating 141 cases over a period of thirty years. In at least 78 per cent the affection

began before puberty, and in 42 per cent it began during the first seven years of life. As these are the years during which the face, nose, and its accessory cavities are normally developing most quickly, their development is consequently retarded. When the disease began in adult life, which occurred rarely, the typical facies of atrophic rhinitis did not occur. The disease began as an inflammation of the nasal mucosa and in at least half the cases there was a sinusitis. This sinusitis tends to keep the inflammation alive. The ethmoid sinuses and the adenoids are more often affected than is realized. The present custom of dealing with adenoids early has reduced the incidence of atrophic rhinitis. Another factor tending to produce atrophic rhinitis is a deficiency of vitamin A. This deficiency impairs the defence against infection and lowers endocrine function. It may also impair nervous function. The mucosa first reacts to the infection by hyperplasia; later, owing to fibrosis, there is a glandular atrophy and change from columnar epithelium to stratified squamous epithelium; but if the sinusitis is conquered early enough by proper surgical and other measures there may be considerable recovery, with disappearance of crusts and factor. The bone of the thin lamellæ of the turbinates and the ethmoid cells reacts by atrophy, that of the walls of the accessory cavities, by sclerotic thickening. Similar sclerosis is found in the mastoid process of children with chronic suppuration of the middle ear. The paranasal sinuses may fail to reach their full development with consequent facial modification. The treatment found the most satisfactory was that of prevention. This is best accomplished by removal of adenoids in school children suffering from nasal discharge and mouth-breathing. Drainage of a sinusitis by surgical means if necessary is the most important thing if the condition has developed.

GUY H. FISK

Radiology and Physiotherapy

Results of Irradiation in the Treatment of Operable Osteogenic Sarcoma of the Long Bones. Coley, W. B., *Radiology*, 1933, 31: 318.

After quoting opinions in favour of and against irradiation of early cases, the author reviews the statistics of a series of more than 200 cases of operable malignant sarcoma of the long bones treated by primary irradiation (x-rays or radium). He states that "we believe the best method of treating osteogenic sarcoma of the long bones is amputation, without pre-operative irradiation, with, most important of all, a prolonged course of Coley's toxins as a prophylactic after amputation."

In the majority of cases, diagnosis is possible to an experienced man. Delay in operation is

dangerous. He reports a case which developed pulmonary metastases within two weeks following high voltage x-ray treatment. The cases presenting the greatest difficulty in diagnosis have been those involving the upper end of the humerus in children and young adults. It is not justifiable to substitute irradiation for amputation in early operable osteogenic sarcomas, as this deprives the patient of a considerable chance of permanent cure. Quoting Kolodny, "The attempts of pathologists to form a prognosis on a tumour from its pathological and morphological features alone has nowhere failed more than in bone tumours. Of 129 cases of osteogenic sarcomas treated by irradiation no five-year cures were obtained without amputation or resection. There were 7 five-year cures with amputation or resection. In 33 cases of osteogenic sarcoma of long bones, well for five years, the toxins were used in all but 8."

The author concludes that the routine treatment of early operable cases of osteogenic sarcoma by irradiation should be abandoned; also that pre-operative irradiation, while waiting for a consultation of radiologists, is without justification and associated with grave risks. This form of sarcoma is so radio-resistant that it is doubtful if post-operative irradiation would control metastases. The use of Coley's toxins for a prolonged period is advocated following amputation. Irradiation is of considerable value in retarding the growth of inoperable cases and to relieve pain in these cases. Morphine is the treatment of choice in far advanced inoperable cases.

A. STANLEY KIRKLAND

Treatment of Menstrual Irregularities. Shaw, W., *Brit. M. J.*, 1933, 1: 907.

In this article non-malignant conditions that concern the menstrual cycle are considered. Menorrhagia may be post-partum or due to over-activity of the anterior pituitary. It occurs in patients around forty-five, near the menopause. The uterus is usually larger and harder than normal, and the condition formerly was erroneously called chronic metritis. Gland extracts are of no service. In patients over forty-five, the uterus is curetted and 50 milligrams of radium inserted for forty-eight hours. "This is an excellent remedy in so far as uterine bleeding is concerned." It is exceptional for further bleeding to take place.

Metrorrhagia occurs most frequently about the age of the menopause, but not infrequently is seen in young women. The treatment consists in giving "Antuitrin S". Also a curettage is done, and 50 milligrams of radium are inserted in the uterus for twelve to twenty-four hours. On theoretical grounds the author considers this practice sound, but confesses certain results as unsatisfactory due to difficulty in securing the correct dosage.

E. E. SHEPLEY

Anæsthesia

Organization and Management of a Department of Anæsthesia in a 200 to 400 Bed Hospital.

Leech, B. C., *Canadian Hospital*, Jan., 1934, 3.

The author bases his suggestions on the experience gained in four years' operating an organized anæsthetic department in a hospital of 410 beds. Under organization, he suggests a full-time director, part-time associate anæsthetists, and interns. The director should supervise the training of his staff, be responsible for the assignment of cases and the maintenance of equipment, and personally order the preliminary medication. He should also keep full records of every case and utilize these in the presentation of an annual analytical report of the work of his department.

Every case should be properly categorized as to its status as a pre-operative risk. A suitable grading is as follows. Grade 1, good risks; grade 2, questionably good risks; grade 3, poor risks; grade 4, very dangerous risks. It should be the duty of the ward intern to classify each operative case the evening previous to operation and enter this on the anæsthetic chart which accompanies the patient to the operating room. The chief anæsthetist calls at the hospital each evening, examines these collected charts and can intelligently select the anæsthetic procedure, assign a suitable anæsthetist, and order proper preliminary medication for each case scheduled for the next morning. The operative portion of the anæsthetic chart is filled out by the anæsthetist during the operation and gives a "running story" of its progress. The post-operative portion is the responsibility of the ward nurse and from these is prepared the weekly report of post-operative complications which she sends to the record room. From this weekly report much valuable information may be obtained as regards faulty technique or other errors.

The financing of an organized department of anæsthesia should not involve an additional cost to the hospital. Anæsthetic agents which are expensive, such as gas and spinal preparations, should be charged directly to the patient, but ordinary agents such as ether, chloroform or ethyl chloride should not bear a separate fee but should be absorbed in the operating room fees. The intern anæsthetists naturally do not receive compensation in the regular course of a rotation service. Associate anæsthetists should have their fee added to the patient's hospital bill and credited to them when paid. The director may be paid in one of two ways; first, by the hospital collecting his fees and paying him a fixed salary with a percentage bonus of profits earned and collected over and above his salary; the other system collects all the fees of the director and credits them to his account, but here some minimum income should be

guaranteed by the hospital especially when starting off with a newly formed department. Either system should provide for the director spending at least one month of each year in travel and visiting other institutions.

In conclusion, every hospital over 200 beds should have an organized department of anæsthesia which soon becomes a source of pride to the administration and of comforting assurance to the patient and the community at large.

ARTHUR WILKINSON

Cyclopropane as an Anæsthetic Agent: A Preliminary Clinical Report. Stiles, J. A., Neff, W. B., Rovenstine, E. A. and Waters, R. M., *Anæsthesia & Analgesia*, 1934, 12: 56.

Cyclopropane (trimethylene) is a saturated hydrocarbon gas with the formula C_3H_6 . It was first prepared by Freund in 1882 but it remained for Henderson and Lucas to publish a laboratory study of its anæsthetic properties (*Canad. M. Ass. J.*, 1929, 21: 173-175). The latter workers reported the production of anæsthesia in laboratory animals with 10 to 20 per cent cyclopropane in oxygen.

The present authors have used this anæsthetic in 447 cases. Preliminary medication consisted of morphia, gr. $\frac{1}{8}$ - $\frac{1}{4}$, combined with scopolamine, gr. 1/200-1/100, administered one and one-half hours previous to induction. In the production of anæsthesia it must be remembered that the gas is quite irritating in high concentrations, and it is wiser to add it gradually to the breathing-bag previously filled with oxygen and not to exceed a concentration of 25 per cent. Three to five minutes are required to carry the patient to the stage of surgical anæsthesia. The relaxation obtained is comparable to that in all stages of ether anæsthesia. Complete return to consciousness usually occurs in four or five minutes, but it may take up to ten to twelve minutes. The signs of anæsthesia are much the same as with ether, except that a moving eyeball may persist well into the third stage. From the analysis of gas samples the authors feel that 20 per cent is a high concentration of cyclopropane, 14 to 16 per cent being sufficient for deep anæsthesia and 10 per cent for light anæsthesia.

Observations and experimentation show that cyclopropane has no more effect on vital functions than the anæsthetic agents now in common use. Post-operative complications compare favourably with other agents. The gas has no undesirable physical properties, and although explosive is less so than ethylene. In conclusion, the authors feel that cyclopropane is still in the experimental stage and consider that it deserves one more year of careful evaluation under controlled conditions before any attempt is made to introduce it into general use.

ARTHUR WILKINSON

Obituaries

Dr. Julius Edward Lehmann died suddenly at Montreal on July 3, 1934, while visiting his daughter. He was buried from Holy Trinity Church, Winnipeg, on July 7th.

Born in Muskoka, Ont., on February 8, 1868, Dr. Lehmann studied medicine at the University of Toronto, graduating in 1893. He engaged in general practice for six years at Elmvalle, Ont., and then had five years' post-graduate work in London, Berlin and Vienna, studying under Virehow, His and Lorenz. With this thorough preparation he came to Winnipeg in 1903 at a time when that city was entering upon an era of expansion, and for over thirty years he practised as a surgeon. Shortly after his arrival he was appointed to the honorary attending staff of St. Boniface Hospital, and later to the Winnipeg General Hospital. In 1933 he was appointed to the Honorary Consulting Staff of that institution. A little over a year ago he was appointed by the Lieutenant-Governor in Council a member of the Board of Governors of the University of Manitoba, where his sound judgment and capacity for hard work enabled him to render valuable service.

As a surgeon his work was never showy, but it was



Julius Edward Lehmann

marked by thoroughness, patience and attention to detail, and these qualities were reflected in his clinical teaching. Soon after coming to Winnipeg he became one of the founders and later president of the Winnipeg Clinical Society, which later merged with the Medico-Chirurgical Society, to become the Winnipeg Medical Society. For many years he was Associate Professor of Clinical Surgery in the University of Manitoba.

He is survived by his widow, three daughters and two sons, one of whom is a medical student in the University of Manitoba.

Dr. Lehmann made a distinct contribution to the medical, educational and cultural life of Winnipeg, and the abrupt termination of his life when he was at the zenith of his powers is a real loss to the community.

APPRECIATIONS

For twenty years Julius Lehmann served the Medical School and the University faithfully and well. He was

an educator, not an instructor. His methods were rational and stimulating, and the results impressive. Students who were privileged to sit at his feet will never forget the sharp incisiveness of his statements, the probing questions, the austere bearing that allowed a kindly soul to show through. Interest in the welfare of the school never flagged, and, when he became a Governor of the University the interest simply widened. Those who knew him well intimately recognized and will remember the soundness and breadth of his mental vision, the tolerant understanding way in which he looked at human problems. He was a gentleman, essentially just and kind, able, and willing to use his abilities; withal, humbly content to await the call to service and to answer it with his entire devotion. A. T. MATHERS

I enjoyed Dr. Lehmann's friendship for thirty-three years, meeting him first in London, and soon following him to Winnipeg.

His six years' apprenticeship in an Ontario general practice was followed by five years' post-graduate work in Berlin, Vienna and London. Attracted to surgery even as a general practitioner he worked hard to equip himself thoroughly for his life work, and particularly he was interested in orthopaedics. Nor even in London was his training purely academic, for he was fortunate enough to obtain an out-patient post on the Orthopaedic Hospital where he worked long hours. Hence he came to Winnipeg in 1903 with a deeper grounding in the principles of surgery than any other surgeon west of the Great Lakes possessed, and he soon made his weight felt.

A saving common sense and broad humanity distinguished his professional career in Winnipeg; he was indeed a physician who practised surgery as part of his armamentarium, for he was deeply interested in all phases of medicine and never forgot the patient in the surgical casualty. When occasionally at a medical convention with him I found him as ready to attend a medical demonstration as to watch a purely surgical clinic. But he revelled in the problems of orthopaedic surgery, where his uncanny skill in the use of plaster of Paris served well to maintain the posture of limb or trunk which his judgment deemed the most suitable. Many a poor wretch with frightful deformity from burns of face or extremity blessed his unrivalled technical knowledge of skin-grafting, combined with his unwearying patience. In these special lines, as he demonstrated again and again before his admiring colleagues, he was outstanding, and it is very regrettable that he has left no printed record of his observations and results. In the last ten years he established conclusively the practical value of deep local massage and saline injection in obstinate cases of myalgia—a contribution to therapeutics even now not sufficiently appreciated. His sane conservative surgical outlook, founded as it was in the best European and American traditions, was particularly valuable in Winnipeg to balance a tendency to extremes natural during the period of most rapid surgical development. Dr. Lehmann gave his best to the Hospital. Socratic in his teaching, he was sometimes feared more than loved by the students and his interns, though when in practice later many of them have volunteered to me how much they owed to his precepts and example. His reserved manner hid a warm sympathetic heart, as his old patients knew full well.

Like many other Canadian-born of German extraction he suffered in the war—and in silence and understanding—the tragic aloofness of old friends, and even the suspicions rampant in the cruel narrow nationalism which spread the country for a time. He welcomed, I know, his elevation to the Presidency of the Winnipeg Medical Society later as an expression of confidence from his confrères in him as a Canadian, as well as a tribute to his professional attainments.

He was my best friend.

CHAS. HUNTER

Dr. Amos Wright Campbell, of Prince Albert, Ont., died on June 12, 1934, in his 85th year. He was a graduate of Victoria University (1880).

Dr. J. Emile Choquette died on March 4, 1934, after a short illness, at the age of 58, at Saint Bruno, Que. He studied at the College of Assumption and the University of Montreal, and practised first at St. Liboire and then at St. Bruno for 29 years.

Dr. Andrew Beattie Eadie died at Hemet, California, on May 29, 1934, in his 79th year. He was a graduate of Trinity Medical College (1886).

Dr. Pierre Vincent Faucher, one of the most eminent physicians of Quebec City, Professor of Materia Medica and Therapeutics at Laval University and member of the University Council, died on July 3, 1934, after an illness of two months. He was 68 years of age.

Dr. Faucher studied at the Quebec Seminary and Laval University (M.D. 1887), subsequently practising his profession for forty-five years in the Faubourg St. Jean Baptiste. A Conservative in politics, he represented Quebec Centre in the Provincial Legislature from 1923 to 1927. He was one of the founders of the Quebec Medical Society.

Three children survive, including Dr. Euclide Faucher, of Quebec.

Dr. Alfred Weller Girvin, died in Calgary, on June 11, 1934, at the age of fifty-four years, following a long illness. Dr. Girvin was born at Stella, Ont., where he received his early education. He attended the high school in Napanee in which district he taught for several years following his graduation. He received his degree in medicine from Queen's University in 1905 and then followed a period of post-graduate work in London, England. Coming to Strathmore, Alberta in 1908, he took an active interest in educational and municipal affairs, besides having a wide practice. He came to Calgary in 1925, where he remained in active work until February, 1933. In May, 1933, he entered the Provincial Sanatorium at Keith.

Dr. Girvin's death is a distinct loss to the community in which he practised. He had a wide circle of friends and among his confrères in Calgary was admired for his many fine qualities. He was a past-master of the Masonic Lodge in Strathmore. His wife, a son and two daughters survive him. G. E. LEARMONTH

Dr. John Henry Grant, of Niagara Falls, Ont., died on June 25, 1934. He was the second son of the late Sir James Alexander Grant, K.C.M.G., M.D., of Ottawa. He was in his 75th year. Dr. Grant graduated from McGill University in 1886.

Dr. Charles A. King, of Sussex, N.B., died in the Frances Sproul Hospital in that town on June 11, 1934, three weeks subsequent to an operation. Dr. King was born at Steeves Settlement fifty-nine years ago. He graduated from the College of Physicians and Surgeons of Baltimore, practised in Salisbury from 1904 to 1910, and subsequently in Petitcodiac, until 1923, when he was appointed medical inspector of schools for the counties of Albert, Kings, Queens and Charlotte. He is survived by his wife, one son and one daughter.

Dr. William Alexander McCracken, of Montreal, died on June 22, 1934. He was born at Cornwall, Que., in 1887 and graduated from McGill University in 1910.

Dr. McCracken was a member of one of Cornwall's oldest families, the only son of Alexander McCracken, a former mayor of this town. Dr. McCracken specialized in children's diseases and was for many years attached to the Western Hospital in Montreal. He was a great lover of the outdoors, an expert cameraman and philatelist. His widow and father survive.

The Hon. Dr. James Palmer Rankin, of Stratford, Ont., died on June 15, 1934, after an illness lasting several weeks.

Dr. Rankin was born in East Zorra Township of Oxford County, in 1855, the son of the late Mr. and Mrs. David Rankin. His father was a well-known and prosperous farmer of the district, who originally came from Scotland. Dr. Rankin went to the rural school and later to a boys' school in Hamilton, after which he entered Trinity Medical College, Toronto, graduating in 1878 with high honours and the degree of M.D. He then went to Edinburgh where he received the diploma of L.R.C.P. & S. Returning to Canada he started to practise medicine at Tavistock, going from there to Toronto, and later moving, in 1891, to Stratford, where he became a foremost member of the medical profession.

During his residence in Stratford Dr. Rankin was diverse in his activities, not confining himself entirely to his own profession, but branching out into the field of politics, where he received a generous share of success. He was elected a Liberal member of the Dominion Parliament in 1908, was defeated in 1911 and in 1917, but was elected again in 1921. He remained the representative of North Perth until he was appointed a senator in 1925. During his career in Dominion politics Dr. Rankin was a firm upholder of the Liberal standard. In city affairs he was also prominent, having been a member of the board of education and the city council.

Dr. Rankin was also a lieutenant-colonel of the Canadian Army Medical Corps, and for 20 years was medical officer of the 28th Regiment at Stratford. During his career in Stratford, Dr. Rankin had more of the confidence and respect of his fellow-citizens than perhaps any other man. During his occupancy of civic offices he proved a faithful servant of the people and during his years in Parliament and since his elevation to the Upper House he continued to merit the confidence of the people not only of his own constituency but of his province and country.

Senator Rankin is survived by two daughters, Miss Gertrude and Miss Ethelwyn, both residing at home. His wife died in 1915. A son, Dr. Ramsay Rankin, died in 1921.

Dr. George Arthur Schmidt, of Cobalt, Ont., one of the best known physicians in northern Ontario, who had practised in the silver mining belt for the last 28 years, died at Toronto General Hospital on June 25, 1934, after a brief illness, in his 63rd year. He was born at Waterloo, Ont., on March 17, 1872, received his early education at Stratford, going from there to Trinity Medical School, and after graduation (1899) took post-graduate work in England and Scotland. Before settling in Cobalt in June, 1906, he served as ship's surgeon on several ocean liners and had been in charge of the International Nickel Company's medical work at Copper Cliff. He is survived by three sisters, Miss Bertha Schmidt, Cobalt; Mrs. Claire Durst, Toronto, and Mrs. E. Heath, Ottawa, and one brother, Walter Schmidt, Vancouver, B.C.

Dr. Romuald Tessier died at Laval-sur-le-Lac, Que., on May 10, 1934, at the age of 59. He was born at Laehine, and studied at the Collège Sainte-Marie, graduating in medicine from the University of Laval, Montreal, in 1897. He later specialized in dermatology and urology, and came to have charge of a large clinic in Montreal. He had taken an active part in the war and had gone over with the Laval Hospital. He had several decorations, notably the Order of Leopold II.

DRY POWDER CAPSULES

STABLE » ACCURATE » READILY ABSORBED
TASTELESS » CONVENIENT » ECONOMICAL

★ To ensure the integrity of biological tests on Digitalis, all tests for this and other Ayerst biological products are made under the immediate supervision of Dr. A. Stanley Cook and his associates in the biological laboratories of Ayerst, McKenna & Harrison Limited, located at Montreal.

Ayerst Dry Powder Capsules Digitalis Folium contain powdered digitalis leaf of the *International Standard* and are tested by the method employed by the Laboratory of Hygiene of the Department

of Pensions and National Health, Ottawa. *Unlike tinctures of the drug*, the clinical efficiency is assured for a period of several years when kept under normal storage conditions.



They are supplied in five strengths:

No. 311 equals	5 minims	Tincture of Digitalis	Canadian Formulary						
No. 312	" 10	"	"	"	"	"	"	"	"
No. 313	" 15	"	"	"	"	"	"	"	"
No. 314	" 20	"	"	"	"	"	"	"	"
No. 315	" 30	"	"	"	"	"	"	"	"

Note: The contents of capsule No. 311 show the physiological potency of $\frac{1}{2}$ grain (0.032 Gram) of Powdered Digitalis Leaf International Standard. The potency of the other capsules is relative. This standard leaf contains, in each gram, 10 International Units.

Dr. Geo. F. Skinner has returned from post-graduate work in Great Britain.

Dr. W. O. McDonald is in Boston, doing post-graduate work in diabetes and metabolism.

On July 5th, Dr. Wm. Warwick, chief medical officer for the Province of New Brunswick, announced the retirement of Dr. F. J. Desmond, medical health officer for the eastern district, who has served in that capacity since the district was established sixteen years ago. Dr. Desmond previously had practised at New-castle. His position is being filled by Dr. J. A. Melanson, D.P.H., who since 1928 has been employed as Tuberculosis Diagnostician in the eastern district of New Brunswick.

Dr. O. E. Morehouse has been granted six months' leave of absence, and will be succeeded by Dr. J. A. Cameron. In this case also he will combine the duties of District Medical Health Officer, and those of travelling Tuberculosis Diagnostician. Dr. Mcmillan, medical officer in the southern district, will also carry on the combined services. Dr. J. E. Paulin, district medical officer for the northern district, will be associated with Dr. A. M. Clark, travelling Tuberculosis Diagnostician.

Due to the additional services required from medical officers of health in the various districts, the six school medical inspectors will have their duties extended so that they are to serve as Assistant Medical Health Officers.

A. S. KIRKLAND

Nova Scotia

The 81st Annual Meeting of the Nova Scotia Medical Society was held at Yarmouth under the presidency of Dr. Lebbetter. The meeting of the Executive was held at the Grand Hotel, Yarmouth, N.S., on the evening of July 3rd. The general business meeting was held at the Y.M.C.A. Auditorium on the morning of July 4th. Officers for the coming year were elected as follows: *President*, Dr. Daniel McNeil, Glace Bay; *First Vice-president*, Dr. G. A. Dunn, Pietou; *Second Vice-president*, Dr. P. E. Belliveau, Meteghan; *Secretary*, Dr. H. G. Grant, Halifax; *Treasurer*, Dr. W. L. Muir, Halifax.

The next meeting will be held in Sydney, the first week of July, 1935.

There were 104 doctors registered, nearly half of the paid membership. There were 175 persons at the banquet held at 7.30 p.m. on July 5th, at the Grand Hotel which was attended by Lieutenant-Governor Covert and Mrs. Covert, Premier A. L. Macdonald and Mrs. Macdonald, His Worship Mayor Walker, of Yarmouth and Mrs. Walker, Dr. Grant Fleming, of Montreal, a delegate from the Canadian Medical Association, Dr. E. T. Tanton, of Summerside, the delegate of the Prince Edward Island Medical Society, Dr. Gilbert Horrax and Dr. Haggart, of the Lahey Clinic, and Dr. George W. Crile, of Cleveland.

Dr. Jane Sands Robb, of the Medical School, Syracuse University, is spending her vacation at Bedford. She is well-known for her researches in cardiology. At the meeting of the American Medical Association held at Cleveland in June she was awarded a certificate of merit for her work.

Dr. Murray Beardsley, a Nova Scotian and a graduate of Dalhousie University, who is engaged in practice at Providence, Rhode Island, was awarded the annual prize given by the Trustees of the Fiske Fund for a paper on "Appendicitis: its diagnosis, treatment and end-results". Dr. Charles O. Cooke, his co-laborator, shared the prize with him.

Dr. Harvey Hebb, who graduated in May of this year from Dalhousie University, has been appointed surgeon of the C.G.S. Arras. The holder of this appointment is expected to proceed abroad for further study after the termination of his summer duties.

Dr. Harold MacKean has been appointed to the Medical Staff of the International Paper Mills at Grand Falls.

Dr. J. A. Sponagle, of Middleton, and Dr. J. B. Reid, of Truro, have been appointed members of the Provincial Medical Board.

Dr. Florence J. Murray, a graduate of Dalhousie University, who has spent some years in Korea as a medical missionary, is expected in the province shortly, where she will spend part of her furlough.

N. B. DREYER

Ontario

The first sod for the building of the new Women's College Hospital was turned by Mrs. A. M. Huestis, president of the board of governors, on June 5th. The first wing to be built is to cost approximately \$600,000.

The Board of Governors of the Toronto Western Hospital announced on June 25th that the contract had been granted for the construction of the new pavilion and for alterations to the present building. The new wing will have fourteen stories and a solarium. The estimated cost is \$800,000.

The City of Toronto has recently provided \$44,721 to meet the deficits of the city hospitals for the year ending September 30, 1933.

Dr. C. P. Brown, who was for 11 years superintendent of the quarantine station at the leper hospital at Bentinck Island, B.C., recently gave an address in which he described the methods used in the prevention and cure of leprosy.

At the Happyland Camp, Niagara-on-the-Lake, several more permanent cottages are being erected on the grounds on the Lake Shore, to provide further holiday accommodation for tuberculous veterans and their families.

J. H. ELLIOTT

Quebec

The official opening of the Institute of Parasitology at Macdonald College, Ste. Anne de Bellevue, on June 27th, by Dr. H. M. Tory, President of the National Research Council, puts Macdonald College in the proud possession of having within its grounds the only institute in the world specially built for working on animal parasites, and the occasion was marked by speeches that gave high praise to the Quebec Government who have provided the building and the National Research Council who have undertaken the maintenance of the institute.

A portion of the building has been in operation for some eighteen months past, and it has been drawing its research material from stock maintained locally, from packing plants throughout the Dominion, from voluntary collectors stationed in every province, including the Northwest Territories situated within the Arctic Circle, from the Quebec Zoological Gardens, and from individual naturalists, stock owners and others throughout the Dominion and in the West Indies, as well as from other parts of the Empire.



TWO WORDS to lighten a mother's worries

"TRY CLAPP'S." A simple, sensible, two-word prescription. It can make the sun shine again for a worried mother . . . and change a cantankerous youngster into a model of mealtime behavior!

Babies have their own good reasons for refusing home-cooked vegetables. They've been used to liquid foods that are unvarying in texture—naturally they shy away from home-prepared vegetables that vary in consistency from one feeding to another.

But Clapp's Baby Foods . . . ah, that's a different story altogether! Even tiny babies like them right

away. They're smooth—with the silky consistency that comes from uniformly fine texture. Their flavor is unvarying good . . . the appetizing, natural goodness of the finest fruits and vegetables.

For over twelve years Clapp's have maintained their high quality—now, with the new low price, you may recommend them with confidence. For literature and information write
HAROLD H. CLAPP CO. Limited,
Montreal

NOW 15¢
In The New
Enamel
Purity Pack



15 VARIETIES The World's Largest Baby Menu

Baby Soup (Strained) . . . Baby Soup (Un-strained) . . . Vegetable Soup . . . Beef Broth . . . Wheatmeal Cereal . . . Spinach . . . Carrots . . . Peas . . . Asparagus . . . Tomatoes . . . Beets . . . Wax Beans . . . Prune Pulp . . . Apricot Pulp . . . Apple Sauce.

Each and every one made as baby foods should be made—under medical supervision and hospital standards of cleanliness. Cooked in glass-lined vacuum kettles, to conserve vitamin value and mineral salt content. And offering the variety so necessary for an interesting and well-rounded dietary plan.

CLAPP'S
Original
Baby Soups and Vegetables

The ceremonies were presided over by W. M. Birks, senior governor of McGill University, in the unavoidable absence of E. W. Beatty, Chancellor of McGill, and he was accompanied by Dr. F. M. G. Johnson, Dean Martin and Col. Wilfred Bovey from the University, with many representatives of the federal and provincial governments, and of universities from all over the Dominion.

Dr. H. M. Tory, in formally opening the institute, traced the history of its development, mentioning that the original idea was that it would undertake research in parasitology not only for Canada but for the various parts of the Empire, and that was why the Empire marketing board had agreed to share the cost of maintenance, but with the disappearance of this board the responsibility rested upon the National Research Council itself under the direction of a committee approved by the council and McGill University. Dwelling on the importance of research work Dr. Tory mentioned that the average of human life in the last fifty years, through the application mainly of bacteriological science, had been lengthened by over twenty years. Intellectually from the same source had sprung a series of institutions for the scientific training of men, and the accumulating knowledge had become part of the intellectual life of everyone who pretended to have any claim to participating in the world's thought.

The increase in the world's wealth as a consequence of bacteriological developments paralleled the tremendous economic developments resulting from the physical sciences and must be given an equal measure of importance. Similarly, the modern foundation for the study of parasitology had started a new era in the development of science, the value of which to human life and human happiness would, without question have to be measured by similar standards.

"In the age that is before us, when in all probability the struggle for national self-sufficiency is to be a marked characteristic of a considerable period of time, it behooves us in Canada to organize the study of our resources in relation to our own national life to the limit of our power. To this end we must make preparation for the training of men in such institutions as this institute, to cover every phase of the organized life of the country. We must learn to use and not abuse our natural resources.

"Under our present economic organization we are to a considerable extent dependent upon export trade. The competition involved in our future development can only be met by a vigorous application of science in connection with those products which enter the world's markets. Industry may prosper for a time, leaning on artificial props, but in the long run, knowledge, intensively applied, will be found to be the only permanent safeguard."

Dr. T. W. M. Cameron, the Director of the Institute, in accepting the keys, paid a tribute to the interest and generosity of the Quebec Department of Agriculture in providing the building and declared that no place more fitting for a Canadian institute of parasitology could exist than McGill University. Macdonald College had been one of the instruments throughout the years in bringing about that unity and concord of the two races that gave their strength to the great Canadian stream of national life. Dr. Cameron also paid tribute to the generous cooperation of his administrative colleagues, and particularly to T. F. Ward, the bursar and his staff. He also thanked the National Research Council who had supported them through trying times, in spite of the fact that the Empire Marketing Board, their other original sponsor, was dissolved before its obligations were completed. That debt he promised would be repaid through faithful service. The Council's associate committee on parasitology had been unsparing in its efforts to organize and direct the policy of the institute. The original idea of a department of parasitology had come from Sir William Osler as long ago as 1907, and this had been established in McGill under Dr. Todd.

General

Deaths from External Violence, 1933.—According to a report issued recently by the Dominion Bureau of Statistics the number of deaths in Canada from external violence during the year 1933 (preliminary figures) was 6,173 as compared with 6,645 in 1932 and 7,172 in 1931. The rate per 100,000 population was 58 in 1933 as against 63 in 1932 and 69 in 1931. The 1933 rate was the lowest recorded in Canada during the period 1926-33 for which vital statistics have been compiled on the same basis for all provinces. The highest rate recorded during this period was 73 per 100,000 in 1930.

Suicides numbered 917 in 1933, as compared with 1,024 in 1932 and 1,004 in 1931. The death rate from suicide was 8.6 in 1933, as against 9.8 in 1932 and 9.7 in 1931. The year 1933 marked the first important recession in the suicide rate since its marked upward movement in 1930.

There were 142 homicides in 1933, giving a rate of 1.3 per 100,000. These figures compare with 158 deaths and a rate of 1.5 in 1932, and 172 deaths and a rate of 1.7 in 1931.

The number of deaths resulting from accidents in 1933 was 5,114 and the rate 48 per 100,000, as compared with 5,463 deaths in 1932 giving a rate of 52 and 5,996 deaths in 1931 giving a rate of 58. The 1933 rate was the lowest during the period 1926-33.

Drownings in 1933, exclusive of those occurring in land or air transportation, numbered 993 or 20 per cent of the total of fatal accidents. Land transportation accounted for 1,331 deaths, or 26 per cent of the total. Of these, deaths in automobile accidents numbered 954, or 19 per cent of all accidental deaths. Excluding those cases where an automobile was involved, there were 204 deaths in railroad accidents and 21 in street-car accidents. Accidents in mines and quarries accounted for 71 deaths. Twenty-three persons were killed during the year in aeroplane and balloon accidents.

The First International Congress of Electro-Radio-Biology.—The International Society of Radio-Biology announces that His Excellency Benito Mussolini, on account of the favourable advice of the National Council of Research, approved the initiative to call an International Congress of Electro-Radio-Biology. This the First International Congress on this subject will take place from September 10 to 15, 1934, in the Doges' Palace at Venice.

The Congress will be presided over by His Excellency the Marquis Guglielmo Marconi, President of the Royal Academy of Italy, President of the National Council of Research, State Senator, and by His Excellency, Count Giuseppe Volpi di Misurata, State Minister, State Senator. The object of this Congress is to invite for a discussion physicists, chemists, biologists, naturalists, and physicians, on biological actions of all radiations, in order to coordinate their respective investigations. Moreover, the organizers of the congress hope to determine a new radio-biological direction for many present physical and biological investigations.

For further information apply to the General Secretary of the Congress, Dr. Giocondo Protti, S. Gregorio, 173 - Venice, Italy.

The Thirty-sixth Annual Meeting of the Medical Library Association was held in Baltimore, Md., May 21st to 24th, under the presidency of Miss Marcia C. Noyes, Librarian of the Medical and Chirurgical Faculty of the State of Maryland.

The next annual meeting will be held in Rochester, N.Y., in June, 1935.

The following officers were elected for 1934-35: *President*, Mr. Charles Frankenger, Brooklyn, N.Y.; *Vice-president*, Miss Louise Ophuls, San Francisco, Cal.;

INTRAMUSCULAR USE OF LIVER EXTRACT

The administration of liver or of liver extracts has become a firmly established therapeutic measure which restores the blood picture to normal and improves the general condition of patients suffering from pernicious anaemia.

Sometimes, however, patients are too ill to take liver or liver extract by mouth. For such patients, or for any other case in which the physician considers parenteral injection to be desirable, the intramuscular use of liver extract is recommended.

Extensive clinical trials have shown that for intramuscular injection a most desirable concentration of liver extract is such that each cc. of the solution contains active substance derived from 10 grams of liver. A preparation of this strength is now available from the Connaught Laboratories in packages of 5 vials. In each vial there are 10 cc. of a sterile aqueous solution containing active substance from 10 grams of liver in each cc. Injections of this solution may be given daily, semi-weekly, or weekly in doses which range up to 10 cc. As regards a maintenance dose of the extract, clinical observations have shown that patients may be maintained satisfactorily on extract from 100 grams of liver per week, i.e. on 10 cc. of the solution.

▼▼
*Prices and information relating to the use of
Liver Extracts in the Treatment of Pernicious
Anaemia will be supplied gladly upon request.*
▼▼

CONNAUGHT LABORATORIES

University of Toronto

TORONTO 5

" "

CANADA

Secretary, Miss Frances N. A. Whitman, Boston, Mass.; *Treasurer*, Miss Mary Louise Marshall, New Orleans, La.; *Chairman, Executive Committee*, Miss Marjorie J. Darraach, Detroit, Mich.

International Medical Post-graduate Courses in Berlin.—The following international medical post-graduate courses have been arranged for October, 1934, by the Berlin Academy for Medical Post-graduate Training, under the auspices of the Mayor of the city of Berlin, and in succession to the Society of Lecturers for Medical Post-graduate Training in Berlin.

1. Internal Medicine with special regard to tuberculosis, October 1st to 13th. Fee, 60 RM.

2. A course in Tuberculosis in the tuberculosis hospital of the city of Berlin, "Waldhaus Charlottenburg" in Sommerfeld, from October 15th to 20th. Fee, 50 RM. Accommodation and board can be obtained for 2.70 RM per day.

3. Obstetrico-gynaecological post-graduate training week, from October 15th to 20th. Fee, 50 RM.

4. Post-graduate course in Diseases of the Ear, Nose and Throat, from October 1st to 13th. Fee, 120 RM.

5. Post-graduate course in Pædiatrics, from October 22nd to 27th. Fee, 50 RM.

6. Surgical Intrathoracic Diseases, with special regard to Pulmonary Tuberculosis, from October 29th to November 2nd. Fee, 80 RM.

7. Individual Courses in all branches of medicine, with bedside and laboratory practice are held every month. The fee is 50 to 80 RM, for 8 lessons of two hours each. In these courses special attention is paid to practical work; theory plays a minor part.

Programs and further particulars are obtainable from the Berlin Academy for Medical Post-graduate Training, Berlin NW 7, Robert Koch-Platz 7 (Kaiserin Friedrich-Haus). German as well as foreign doctors can attend the courses.

Foreign students attending the courses obtain a reduction of 60 per cent in fares from the German railways.

to the tree-shrews (Tupaiaidae), which the author regards not as insectivores but as an early offshoot from lemurine stock. For the rest, he follows Elliott Smith and others in dividing the Primates into Lemuroidea, Tarsioida and Anthropeidea; and believes that all existing Primates, and probably all the well-known fossil types, "are but the products of a number of collateral lines of descent, many of which have evidently passed through a long period of evolutionary independence." The book is attractively, almost sumptuously produced, and illustrated with clear and vigorous line drawings; it may be unreservedly recommended.

Essentials of Infant Feeding and Pædiatric Practice.

Henry P. Wright, B.A., M.D., F.R.C.P.(C.), Physician-in-Chief to the Montreal Children's Hospital. 212 pages. Price \$3.75. Oxford University Press, London; McAlinsh & Co., Toronto, 1934.

This book on the practice of pædiatrics, written primarily for the student of medicine and the general practitioner, presents in a most practical manner the present-day trend of pædiatric practice. The majority of the common problems encountered in every day practice have been considered. The following headings of Section II of the book give an indication of its practical nature: Failure to gain Weight, Vomiting in Infancy, Diarrhoea in Infancy, Anhydremia, Acidosis and Alkalosis, Constipation in Infancy, Prematurity, Rickets, Tetany, Scurvy. The book is most concise, and gives all instructions in an explicit manner. It can be recommended as a useful addition to the library of every medical student and physician.

Textbook of Pharmacology and Therapeutics. Arthur R. Cushny, M.A., M.D., LL.D., F.R.S. Tenth edition revised by C. W. Edmunds, A.B., M.D., Prof. of Materia Medica and Therapeutics, University of Michigan, and J. A. Gunn, M.A., M.D., D.Sc., Prof. of Pharmacology, University of Oxford. 786 pages, illustrated. Price \$6.50. Lea & Febiger, Philadelphia, 1934.

This valuable book has undergone for the second time a careful revision by these followers of Cushny, as may be seen by its increase in size by 43 pages, with an increase of a page in the index. Largely, the revision has consisted in the addition of paragraphs or sentences dealing with the more recent advances in knowledge. It in consequence still retains the flavour of the original work and the excellence of its English is preserved. Yet one cannot but feel that in several places a complete rewriting from a modern point of view would have saved space and led to a greater clarity. The book can, however, be recommended to the profession as quite one of the best in the English language. The printing and binding are excellent.

BOOKS RECEIVED

Diet and Personality. L. Jean Bogert, Ph.D. 223 pages, price \$2.40. Macmillan Co., New York and Toronto, 1934.

Localization of Function in the Cerebral Cortex. Proceedings of the Association for Research in Nervous and Mental Diseases, New York, December 28 and 29, 1932. Vol. 13 of Series of Research Publications, 667 pages, illustrated. Price \$8.00. Williams & Wilkins, Baltimore, 1934.

The Menace and Geography of Eclampsia in England and Wales. Norman Porritt, M.R.C.S., L.R.C.P., Consulting Surgeon, Huddersfield Royal Infirmary. 88 pages. Price \$1.75. Oxford University Press, London; McAlinsh & Co., Toronto, 1934.

Ocular Dioptrics and Lenses. G. F. Alexander, M.B., C.M., Late Ophthalmic Surgeon, Scarborough Hospital. 216 pages. Price \$4.15. Baillière, Tindall & Cox, London; Macmillan Co., Toronto, 1934.

Book Reviews

Early Forerunners of Man. W. E. LeGros Clark, D.Sc., F.R.C.S., Professor-elect of Anatomy, Oxford University. 296 pages, illustrated. Price \$4.95. Baillière, Tindall & Cox, London; Macmillan & Co., Toronto, 1934.

Professor LeGros Clark has signalized his recent translation to Oxford by the publication of a work in keeping with the best traditions of that university, a singularly lucid and learned account of the comparative anatomy of the Primates, and one which no one even slightly interested in the subject can afford to neglect. His object is to construct the genealogical tree of the Primates from morphological evidence, and in successive chapters he discusses the evidence of the skull, of the teeth, of the brain, and so forth, with a final chapter on his conclusions. The breadth of his survey saves his classification from the artificiality that marks certain rival schemes; it may surprise some readers to find how largely the argument is based on comparatively recent research. Professor Clark keeps strictly within his subject, making little use of physiological data or arguments based on geographical or geological distribution; nor does he deal extensively with early human species, and even the great apes, living and fossil, are rather briefly dismissed, so that the book does not overlap such works as Keith's *Antiquity of Man*. A special chapter is devoted

MEDICAL BOOKS**H. K. LEWIS & CO. LTD.****Medical Publishers & Booksellers**

Large Stock of Text-Books and Recent Literature in all
Branches of Medicine and Surgery. Books Advertised or
Reviewed in this Journal Supplied Promptly on Request.

Periodicals supplied at Subscription Rates.

COLONIAL LIBRARIES, COLLEGES AND SIMILAR
INSTITUTIONS

Special facilities for executing Large Orders for Shipment to
all parts of the World.

SECOND-HAND BOOK DEPARTMENT,
140 GOWER STREET,

—Catalogue post free on application.—

Old and rare books sought for and
reported free of charge.

To Residents in Canada, South
Africa, Australia, etc.

H. K. Lewis & Co. Ltd. can supply
(Direct by First Mail)

The Publications of all Publishers.

Books sent by C.O.D. where facilities available

Any Book in General Literature not in Stock
Supplied to Order

LONDON:

H. K. Lewis & Co. Ltd., 136 Gower St., W.C.1.

Classified Advertisements

WANTED—Man, M.B., graduate of University of Minnesota Medical School (Class A) licensed by Minnesota Board of Medical Examiners; wishes a rotating Internship; available at once; good references. Apply to 1030 Ashland Ave., St. Paul, Minn.



**F. & R.'s
GENUINE
GLUTEN FLOUR**



Guaranteed to comply in all respects to standard
requirements of the U.S. Department of Agriculture.



Manufactured by
THE FARWELL & RHINES CO.
Watertown, N.Y., U.S.A.

**SAL HEPATICA**

A Carefully Blended and Well-Balanced
Effervescent Saline Combination.

Materially aids in the correction of alimen-
tary toxemias by thoroughly cleaning the in-
testinal canal.

Laxative or active cathartic according to
dosage.

Samples for clinical trial

BRISTOL-MYERS COMPANY

75 West Street,
New York

Starch-free - Diabetic Foods

BREAD, BISCUITS, MUFFINS, PIE, PASTRY, DESSERTS

are easily made in any home from

Starch-Free

Listers

Self-Rising

FLOUR

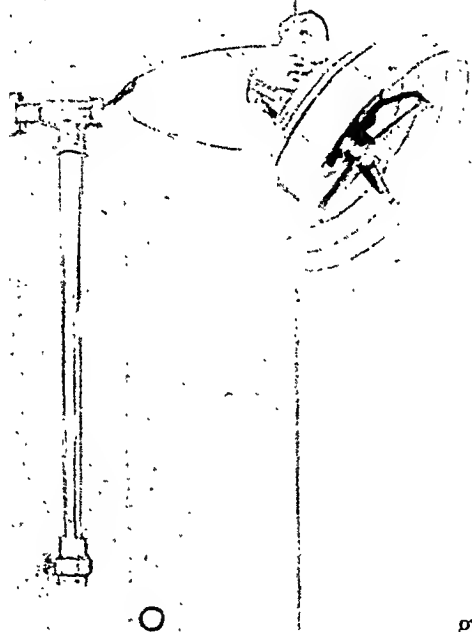
Large carton LISTERS FLOUR (enough for 30 bakings), \$4.85. Small carton LISTE
15 bakings), \$2.75. Please ask us for the name of the nearest LISTER DEPOT

LISTERS LIMITED - HUNTINGDON,

ew Sollux (INFRARED)

RADIANT HEAT

...



With the advent of the new Office Model Sollux Radiant Heat Lamp, which offers the utmost in infrared radiation therapy at a minimum cost, no physician or specialist should be without this form of patient treatment.

This compact, solidly built lamp can be readily adjusted to any desired position for either systemic or local effect. The reflector (heavy gauge aluminum, brush finished on the inside for most effective diffusion of infrared rays) is manipulated from swivel bearings. There is ample clearance between the hood and the telescopic upright which has 32" to 68" height adjustment range. Either a 500-watt tungsten gas-filled bulb or a 600-watt Hanovia type radiant heat generator may be used in the lamp.

The accepted indications for application of radiation from infrared lamps, are acute and subacute infections. Favorable reports have been published covering the treatment of the following conditions: Neuritis, Arthritis, and Rheumatoid Conditions, Organic Nerve Diseases, Fractures, Sprains and Dislocations, Traumatic Synovitis, Inflammatory Conditions, Chronic Backache and Bursitis.

The beautiful aluminum-nickel finish of this Sollux Office Model adds professional dignity and a business-like air to any physician's office.

For literature and further particulars please write.

Price
\$ **42**⁵⁰
OFFICE
MODEL



HANOVIA CHEMICAL & MFG. CO.



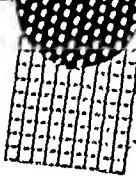
Dept. 258

NEWARK, NEW JERSEY

OXYGEN IS EXCLUDED in the Gerber Straining Process



The Gerber monel metal strainers guard against the danger of broken bits of wire. Five times as fine as an ordinary sieve, they give each Gerber product a uniform, finely subdivided, smooth consistency. Only coarse fibre is removed.



Prevention of Oxidation in This Process Further Conserves Vitamins

After softening by preliminary cooking, each Gerber product is discharged through stainless steel tubes to monel metal strainers, which are completely filled with a blanket of steam at sufficient pressure to exclude oxygen from any contact with the product.

The Gerber straining process contributes directly to the value of Gerber's Strained Cereal as a starting cereal with its combination of desirable qualities of both whole wheat and refined wheat cereals. In the Gerber pre-cooking process soluble nutrients are extracted from the whole

wheat. In the straining process, all coarse bran particles are removed.

Not only in the smooth, uniform texture maintained in the Gerber products, but particularly in the elimination of exposure to oxygen during the straining process, this equipment is another important feature in the extra care which makes the Gerber products "Better for Baby."

Gerber's

9 Strained Foods for Baby



Grown and Packed
in Canada

Strained Tomatoes... Green Beans...
Beets... Vegetable Soup... Carrots...
Prunes... Spinach... Peas... 4 1/2-oz.
cans, Strained Cereal... 10 1/4-oz. cans.

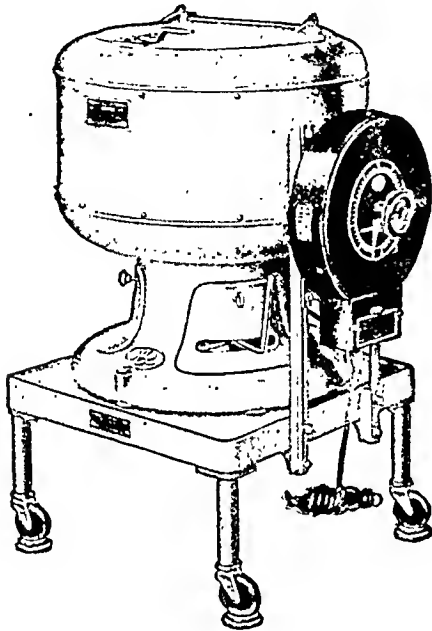
PINE FOODS OF CANADA, LTD., WHITBORO, ONTARIO
Please send me 1 Reprint of the article, "The Nutritive Value of Strained Vegetables in Infant Feeding." 11 Sample cans of Gerber's Strained Cereal

Name..... Address.....
City..... Province.....



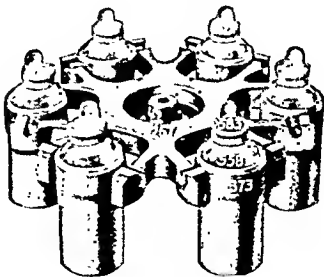
REASONS for the "SIZE 2"

1. Large capacity and power.
2. Adaptability to wide range of accessory equipment.
3. Designed for continuous or intermittent duty.
4. Self contained unit and easily portable.



INTERNATIONAL SIZE 2 CENTRIFUGE with STAND

Research Laboratories demand the International Size 2 Centrifuge because of its wide field of usefulness. It is the centrifuge with overload capacity, protective starting device and flexible speed control.



No. 267 six place
head with No. 373
—250 ml. cups.

See your dealer for further details.

INTERNATIONAL EQUIPMENT CO.
352 Western Avenue - Boston, Mass., U.S.A.

Makers of Fine Centrifuges

SANDALWOOD OIL THERAPY

On which You Can Depend

You need no longer hesitate to use sandalwood oil medication for acute inflammations of the urinary tract—for *Gonorrhea, Cystitis, Vesical Catarrh, Prostatitis, Posterior Urethritis, Pyelitis, Pyelonephritis*—or fear your patients will suffer urinary or gastro-intestinal disturbance. The uncertainty and unreliability as well as the unpleasant side-effects of sandalwood oil therapy are eliminated with

ARHEOL (Astier)



Arheol is a standardized, uniform product on which you can depend. It is all sesquiterpenic alcohol ($C_{15}H_{26}O$), the active principle of sandalwood oil. Being free from the therapeutically inert but irritating substances found in even the best grades of sandalwood oil, it does not cause urinary or gastro-intestinal disturbance.

Write for Information and Sample

ROUGIER FRÈRES

350 Le Moyne Street - Montreal

Canadian Distributors of Products of Laboratoires
P. ASTIER, Paris, France.

For 20 Years

HAY FEVER *has been prevented*

in thousands of cases with **Pollen Antigen**
Lederle

INTRODUCED BY LEDERLE LABORATORIES IN 1914



DIAGNOSIS OF HAY FEVER

With the Lederle Diagnostic Pollen Tests the diagnosis may be made in your office or in the patient's home. A positive reaction occurring with a pollen to which the patient is known to be exposed when he is having Hay Fever indicates the Pollen Antigen to be used in desensitizing the patient. The test is easily performed, accurate and safe.

Physicians are achieving success by treating cases of Hay Fever during the actual attack with an appropriate Pollen Antigen.

When symptoms are present the proper Pollen Antigen Lederle is administered daily gradually increasing the doses till symptoms are relieved when the interval between doses is increased. Ragweed Combined Pollen Antigen Lederle is indicated in 90% of the cases of Hay Fever east of the Rocky Mountains.

Literature upon request.

LEDERLE LABORATORIES Inc.
1396 St. Catherine St. West
Montreal, Que.

AN effective Camp Prenatal Support, embodying the principle of diagonal uplift applied to the adjustment. Two sets of adjustment straps. Upper one gives diagonal support from top of pubis to center back above lumbar region. Lower one affords sacro-iliac and general lower back support from under gluteus upward. This design is available for different figure types.

CAMP
TRADE MARK

*Anatomical and
Physiological Supports*

Camp Anatomical and Physiological Supports embrace Maternity (Prenatal and Postnatal), Postoperative, Visceroptosis, Mammary Gland, Hernia and Orthopedic (Sacro-iliac and Lumbo-sacral), employing the Camp Patented Adjustment, a distinctive and exclusive feature.



S. H. CAMP & CO. OF CANADA, LIMITED

Manufacturers

WINDSOR, ONTARIO

DURING *Convalescence*

When patients need an easily digested food of high calorie value, prescribe **TODDY**.

Toddy is a scientifically formulated food-drink that supplies carbohydrates, proteins, fats and important mineral foods (calcium, phosphorus, iron and others). Easily digested, readily assimilated.

Two or three teaspoons of Toddy mixed in a glass of milk nearly doubles the energy food value and provides an abundance of vitamins A, B and G.

*Simply send your name
and address for a physi-
cian's free sample.*

TODDY

431 King Street West
TORONTO, - ONT.



Mineral Depletion *In The Summer . . .*

. . . **W**ORKERS exposed to prolonged high temperatures tend to suffer from painful and disabling muscular cramps.

The probable explanation is salt loss due to excessive perspiration.

For the same reason, many patients suffer from mineral depletion during the heat of the summer. Frequently such an acidotic condition is associated with summer diarrheas, dermatoses, etc.

How BiSoDoL Helps

In addition to replacing the excessive loss of moisture by the drinking of increased quantities of water, the tendency towards salt loss and acidosis may be conveniently offset by the concomitant use of BiSoDoL.

BiSoDoL is the palatable, balanced antacid-digestant so widely recommended by physicians for relief of acid indigestion, "sour stomach", post-prandial pain, cyclic vomiting.

Write FOR SAMPLES
AND LITERATURE

**THE
BiSoDoL COMPANY
WALKERVILLE, ONTARIO**

The Canadian Medical Protective Association

PRESIDENT - R. W. POWELL, M.D., F.A.C.S.

Founded in 1901, at the Winnipeg meeting of the Canadian Medical Association, incorporated by Act of Dominion Parliament, February 1913, and affiliated with the Canadian Medical Association 1924.

Objects:—

To defend its members against cases of alleged malpractice, and to encourage honourable practice in the daily work of the medical profession. The annual fee is five dollars per calendar year, half-rates after July first.

Subject to our by-laws the taxable costs of actions together with reasonable counsel and witness fees are paid in cases undertaken by our Association, as well as damages if awarded. All members in good standing of the Canadian and various Provincial Medical Associations, may be enrolled upon signing the application form and paying the annual fee. All other regularly qualified practitioners must have their application countersigned by two members of our Association. Blank application forms and other literature upon request.

Address all correspondence to the Secretary-Treasurer

J. FENTON ARGUE, M.D., Secretary-Treasurer, 116 Nepean Street, Ottawa, Canada

CHARLES B. TOWNS HOSPITAL

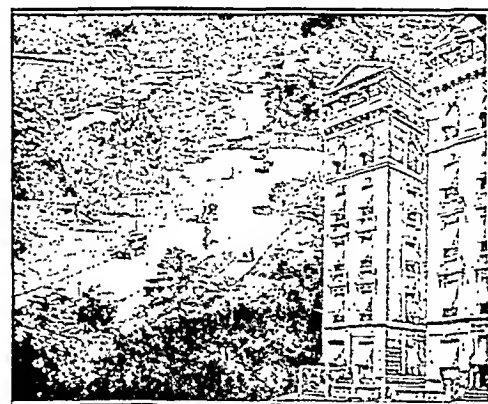
293 Central Park West

New York, New York

For ALCOHOLISM and DRUG ADDICTION

ANY
PHYSICIAN
having an add-
ict problem is
invited to write
for "Hospital
Treatment for
Alcohol and
Drug Addic-
tion."

This institution has specialized in addictions for over 30 years. Its method of treatment has been fully described in THE JOURNAL A. M. A.; in The Handbook of Therapy, from the A. M. A. Press; and in other scientific literature. The treatment is a regular hospital procedure, and provides a definite means for eliminating the toxic products of alcohol and drugs from the tissues. A complete Department of Physical Therapy, with gymnasium and other facilities for physical rebuilding, is maintained. Operated as an "open" institution. Physicians are not only invited but urged to accompany and stay with their patients.



Located Directly
Across from Central Park



"YOU WIN, DOCTOR!"

● "When you said 'no caffeine,' doctor, I tell you my heart sank. But I didn't dream any coffee without caffeine could still be . . . Grand Old Coffee!"

One more patient marked up on the satisfied side. And why shouldn't he be? This brand new Kellogg's Kaffee-Hag Coffee, 97% caffeine-free, has all the full, rich flavor of the delicious coffee it is.

Tried Kaffee-Hag yourself? Then do . . . it's delightful! Make it good and strong . . . bring out all its fine flavor. And notice . . . there's still not a hint of bitterness.

Why? When Kellogg's chemists removed caffeine from this blend of finest Brazilian and Colombian coffees, they discovered a new mellowness. Rich and smooth.

Again we say, try Kaffee-Hag Coffee in your own home. Once you've tried this delicious coffee without caffeine, you'll be recommending it with enthusiasm!

A professional sample will be sent to you upon request.



Kellogg's Kaffee-Hag Coffee is accepted by the American Medical Association with the statement: "Kaffee-Hag is free from caffeine effect, and can be used where other coffee has been forbidden."



KELLOGG COMPANY OF CANADA, LIMITED
London, Ontario

Cook County Graduate School of Medicine

(IN AFFILIATION WITH COOK COUNTY HOSPITAL)

Announces continuous courses

MEDICINE—General and Intensive Courses. (Two Weeks Intensive Course starting October 22nd).

PEDIATRICS—Informal Course—Intensive Course.

EAR, NOSE and THROAT—Informal Course—Special Courses. (Two Weeks Intensive Course starting October 22nd).

SURGERY—General Course One, Two, Three and Six Months; Surgical Technique Two Weeks Intensive Course—Special Courses.

GYNECOLOGY—Three Months Course—Two Weeks Intensive Course—Special Courses.

OBSTETRICS—Informal Course—Two Weeks Intensive Course.

FRACTURES and TRAUMATIC SURGERY—Informal Course—(Intensive Course starting October 22nd).

UROLOGY—General Course Two Months—Intensive Course Two Weeks—Special Courses.

CYSTOSCOPY—Intensive Course. (Attendance limited).

General, Intensive and Special Courses in Tuberculosis, Ophthalmology, Roentgenology, Pathology, Neurology, Electrocardiography, Topographical and Surgical Anatomy, Physical Therapy, Gastroenterology, Allergy.

Teaching Faculty—Attending Staff of Cook County Hospital

Address: Registrar

427 S. Honore Street, Chicago, Illinois

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION

No. 1, Wimpole Street, London, W. 1.

with which is associated some 50 General and Special Hospitals in London, is prepared to offer the following facilities to qualified practitioners:

- I General Courses are arranged covering all branches of Medicine and Surgery. These Courses occupy the student for several hours every day and last for two weeks.
- II Rota of teachers, giving personal tuition at hospital clinics, is arranged and full details are given in a Supplement issued every month in the Journal.
- III Special Courses are arranged at the Special Hospitals associated with the Fellowship, and permit of intensive study in one specialty for a period ranging from 1 week to one month.

The Special Courses arranged for the ensuing months are:—

Infants' Diseases	Sept. 3 to Sept. 15—Infants' Hospital. Afternoon. Fee £3. 3s. Od. (Maximum of 15).
Medicine, Surgery and the Specialties	Sept. 17 to Sept. 29—Westminster Hospital. All day. Fee £5. 5s. Od. (Men only).
Diseases of the Chest	Sept. 24 to Sept. 29—Brompton Hospital. All day. Fee £3. 3s. Od.
Proctology	Sept. 24 to Sept. 29—Gordon Hospital. All day. Fee £2. 2s. Od.
F.R.C.S. (Final) (Evening Course)	(Sept. 25 to Oct. 30 Sept. 27 to Nov. 1) National Temperance Hospital. 8 p.m. Two separate courses on Tuesday and on Thursday evenings. Clinical and Pathological. (Maximum of 25 in each course) Fee £7. 7s. Od. each course.
Diseases of Children.....	Oct. 1 to Oct. 13—Queen's Hospital. All day. Fee £3. 3s. Od.
Dermatology	Oct. 1 to Oct. 27—St. John's Hospital. Afternoons. Fee £1. 1s. Od. (Practical Pathology arranged. Fee £4. 4s. Od.)
Physical Medicine (Evening Course)	Oct. 1 to Oct. 27—London Clinic and Institute of Physical Medicine. Three evenings a week. Fee £2. 2s. Od.
Cardiology	Oct. 8 to Oct. 20—National Hospital for Diseases of the Heart. All day. Fee £7. 7s. Od. (Maximum of 20).
Medicine, Surgery and the Specialties....	Oct. 8 to Oct. 21—Metropolitan Hospital. All day. Fee £5. 5s. Od.
Ophthalmology	Oct. 15 to Nov. 3—Royal Westminster Ophthalmic Hospital. Afternoons. Fee £4. 4s. Od.
Clinical Surgery	Oct. 20 and Oct. 21—Royal Albert Dock Hospital. Saturday and Sunday. All day. Fee £2. 2s. Od.
Gynaecology	Oct. 22 to Nov. 3—Chelsea Hospital for Women. Mornings and/or afternoons. Fee £5. 5s. Od.
Diseases of the Chest. (Week-end Course)	Oct. 27 and Oct. 28—Brompton Hospital. Saturday and Sunday. All day. Fee £1. 11s. 6d.

Copies of all Special Course syllabuses and of the General Course Programme may be obtained on application. The Hospitals reserve the right to make any alterations necessary in dates and fees. Post-graduates are advised, therefore, to make early enquiry. Other courses are arranged from time to time, in addition to the above list.

Lecture Demonstrations on general medicine are given every Tuesday afternoon, and on Medicine, Surgery or one of the Specialties on the second Saturday of every month.

Courses are open only to Members of the Fellowship of Medicine; the annual subscription (from the month of joining) is £1. 1s. Od., which includes the subscription to the *Monthly Post-Graduate Medical Journal*. Overseas subscription, to the Journal only, is 12/- per annum, post free. Every effort is made to assist Members to obtain the post-graduate work they require.

A. E. MORTIMER WOOLF, F.R.C.S.

MAURICE DAVIDSON, M.D.

Honorary Secretaries

HOMewood SANITARIUM

GUELPH, ONTARIO



A private neuropsychiatric hospital with special facilities for the study of early cases to establish diagnosis and determine prophylactic or treatment indications.

75 acres of woods and lawns with ample provision for out and in-door employment and diversions.

GUELPH, reputed as one of the healthiest cities of Canada, is conveniently accessible from Toronto, Montreal, Buffalo and Detroit.

Address Dr. Harvey Clare, Medical Superintendent, Guelph, Ontario

McGill University

MONTREAL

FACULTY OF MEDICINE

C. F. Martin, B.A., M.D., C.M., LL.D., Dean

The regular five-year course of study leading to the degree of M.D., C.M., offers considerable latitude in the choice and arrangement of subjects.

Students who have taken three years of study in the faculty of Arts of McGill University may obtain the degree of B.Sc. on completion of the second year of the medical course.

Opportunities for graduate study are offered in the basic medical sciences and in the clinical fields and courses leading to the M.Sc. and Ph.D. degrees are given under the direction of the Faculty of Graduate Study and Research.

A practical course leading to the Diploma of Public Health is open to medical graduates and Public Health Officers.

Full particulars of entrance requirements, fees, curriculum, etc. are given in the Annual Announcement which may be obtained on application to

PROF. J. C. SIMPSON

Secretary of the Faculty of Medicine

THE NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America.)

UROLOGY

Surgical Anatomy Cystoscopy and
Urologic Operations Endoscopy
Diagnosis and Office Dermatology and
Treatment Syphilology
Regional Anesthesia Diathermy
Proctology Pathology
Neurology Roentgenology
Operative Urology (cadaver)

PHYSICAL THERAPY

Lectures and demonstrations of medical and surgical diathermy; galvanic, low tension and static currents; electro-diagnosis; heliotherapy and artificial light therapy; massage and therapeutic exercise. Active clinical work in the treatment of medical and surgical conditions.

Proctology, Gastro-Enterology and ALLIED SUBJECTS

ANESTHESIA

Regional and spinal (cadaver), with demonstrations in the clinics of caudal, spinal, nerve and field block, covering surgery in Urology, Gynecology and General Surgery. Anesthesia in general, with lectures and demonstrations.

FOR INFORMATION ADDRESS

MEDICAL EXECUTIVE OFFICER, 345 West 50th St., New York City



Hollywood Sanitarium

New Westminster, British Columbia

For the treatment of Nervous, Alcoholic, Toxic, Neurologic and Psychopathic cases exclusively.

Reference: B.C. Medical Association

Write for prospectus and rates to the
Medical Superintendent.

WHY NOT GET THE F.R.C.S.?

Canadian and American Surgeons should send Coupon below
for our valuable publication

"How to Pass the F.R.C.S."

Principal Contents.

The F.R.C.S. England, Primary and Final. The primary F.R.C.S. England examinations can now be taken in Canada. Examinations are held annually in October.
The F.R.C.S. Edinburgh, Ireland.
Diploma in Ophthalmology.
Diploma in Laryngology, Otology, etc.
Other Higher Surgical Qualifications.

You can prepare for any of these qualifications by taking our intensive postal courses of instruction at home and come to England when ready for the examination.

The F.R.C.S. of England or Edinburgh is within the reach of every Canadian or American Surgeon.

Let us help
you to
get it.

THE SECRETARY MEDICAL CORRESPONDENCE COLLEGE

19 Welbeck Street,
London, W.1, England

Sir,—Please send me your booklet
"How to Pass the F.R.C.S.," also
"Guide to Medical Examinations"
by return.

Name

Address

C.M.A.



LAKE EDWARD SANATORIUM

Lake Edward, P. Que.

Built on the shores of beautiful Lake Edward, this Sanatorium is fully equipped for the scientific treatment of pulmonary tuberculosis. Private and semi-private rooms only. Rates moderate. Excellent cuisine. Direct service by Canadian National Railways, both from Montreal and Quebec. Saranac-trained medical staff.

For information, address

DOCTOR J.-A. COUILLARD, B.A., L.Ph., Medical Superintendent

LAKE EDWARD SANATORIUM

Lake Edward, P. Que.



Canadian Association of Massage and Remedial Gymnastics

Members work only under registered medical practitioners and are available for Hospital appointments and for private work.

Attention is drawn to the register of members in the *Canadian Medical Association Journal*, July, 1933, page 108.

Information may be obtained from the following Local Branch Secretaries:—

Miss B. Gallop,
419 Vancouver Block,
Vancouver.

Miss H. Hancock,
719 Medical Arts Bldg.,
Montreal.

Miss E. Henderson,
94 Prince Arthur Ave.,
Toronto.

Miss M. Platt,
Victoria Hospital,
London, Ont.

OR

Miss K. L. Hobbs, Dominion Sec.-Treas.

2 Dewbourne Ave - Toronto

*For Metabolism Studies and
Oxygen Therapy*

SODASORB

(An improved type of Wilson Soda Lime)

THE BEST ABSORBENT FOR CARBON DIOXIDE

For the past ten years, Wilson Soda Lime has been recognized by leading hospitals in America as the outstanding CO₂ absorbent for use in metabolism apparatus and the oxygen tent. Sodasorb, made according to the original Wilson formula, possesses all of the outstanding advantages of Wilson Soda Lime and in addition is even more efficient as an absorbent.

NON-DELIQUESCENT
MOST ECONOMICAL
MOST EFFICIENT
MOST ACCURATE

Please Write For Further Details

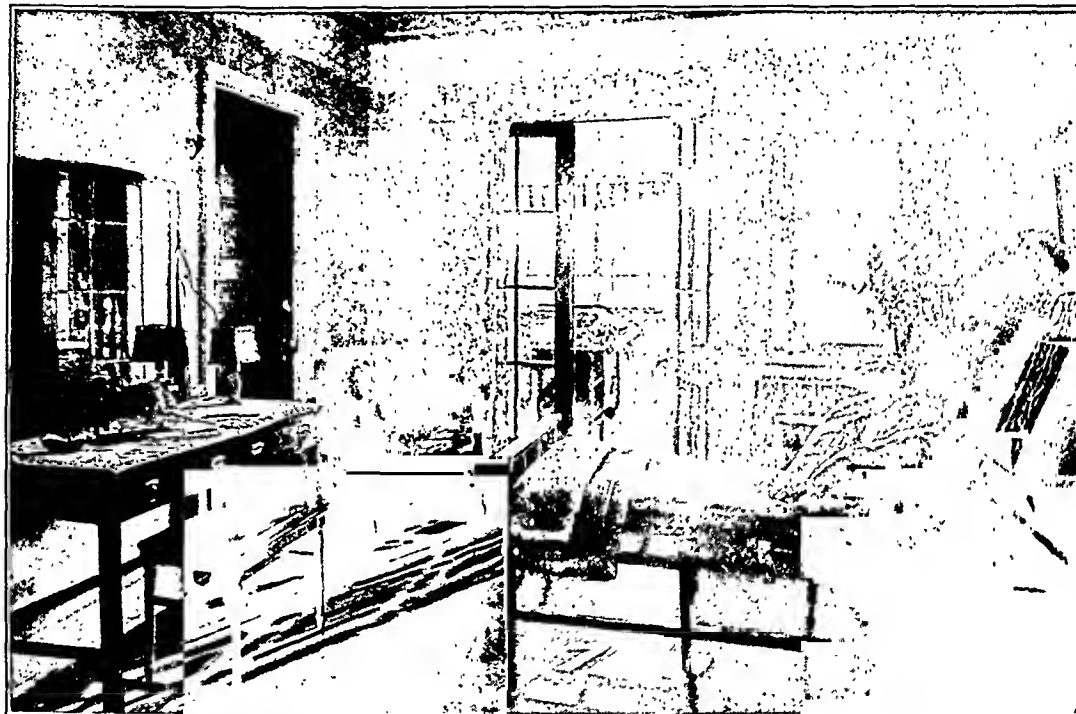
DEWEY & ALMY CHEMICAL CO.
of Canada Ltd.

Farnham, P.Q.

CALYDOR SANATORIUM ON LAKE MUSKOKA

ESTABLISHED 1916

ENLARGED 1923



Patient's Room and Porch Overlooking Lake Muskoka

THE MEDICAL SERVICE is under the immediate charge of Dr. C. D. Parfitt
and his Resident Physician, Dr. S. J. Hawkins

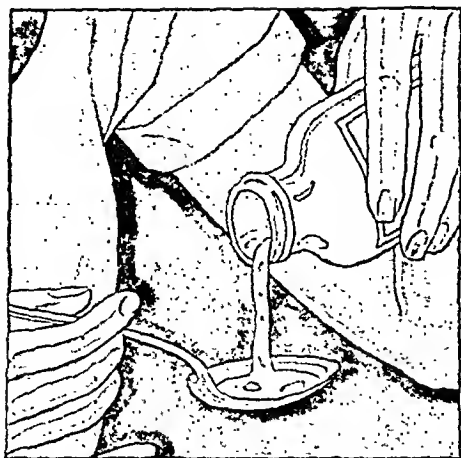
COMPLETELY EQUIPPED FOR THE STUDY AND TREATMENT OF TUBERCULOSIS

WRITE
FOR
TERMS

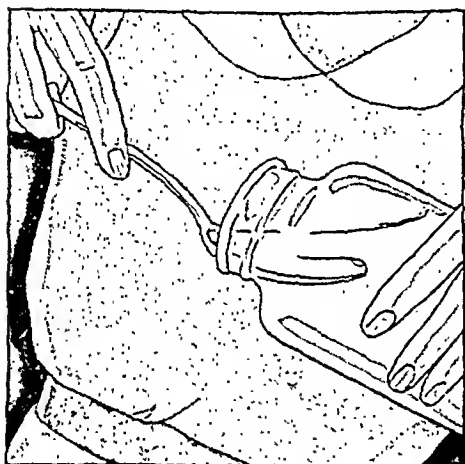
CALYDOR SANATORIUM

Gravenhurst, Muskoka

Ontario - Canada



Now you see AGAROL



Now you see something else

A GOOD emulsion pours freely—and Agarol does. You fill the spoon for a dose, you don't scoop it out of the bottle. Or if you prefer, you place a dose in a glass, stir it a bit, and take it that way. A pleasing drink it is, too. For children, you add it to milk—and they like it.

■ Agarol is the original mineral oil and agar-agar emulsion with phenolphthalein. It affords easier and more thorough mixing with the intestinal contents. It offers greater palatability, absence of oily taste, and greater convenience in use. There is no sugar in Agarol; no artificial flavoring to get used to.

■ The treatment of constipation is much less of a problem when you rely on the dependable action of Agarol for thorough softening of the intestinal contents, for evenly distributed lubrication of the intestinal canal, and for gentle stimulation of the peristaltic function.

■ Try it. A request on your letterhead will bring you a complimentary supply.

AGAROL FOR CONSTIPATION

Agarol is supplied in bottles containing 6 and 14 ounces.

The average dose is one tablespoonful.

WILLIAM R. WARNER & CO., LTD.
727 King Street, West Toronto, Ont.

Combat Summer Diarrhea with Powdered Protein Milk

"During the hot summer months when the diarrheas are severe and difficult to correct and infants are much more prostrated, protein milk is practically indispensable. In the author's hands, it has been more prompt in its action and saved more lives than any other one food."—Denett: "Simplified Infant Feeding".

FOR the treatment of summer diarrhea and other gastro-intestinal upsets common in hot weather, C.M.P. Brand Powdered Protein Milk has been clinically proved to be of unusual value. The long and successful clinical history of this product is borne out by innumerable favorable references in pediatric literature.

C.M.P. Brand Powdered Protein Milk is a cultured product. It is always uniform. It has the highest acidity of any protein milk and has the correct hydrogen-ion concentration. It is one of the most digestible foods known for infant feeding. A trial will convince you of its efficacy.

Klim Powdered Whole Milk and C.M.P. Brand Powdered Whole Lactic Acid Milk are also available.

Literature and samples sent on request

THE BORDEN COMPANY LIMITED

Canadian Milk Products Division

YARDLEY HOUSE - - TORONTO

**C. M. P. BRAND
POWDERED
PROTEIN MILK**

I say, Doctor

...what's this I hear
about your **NEW**
FLUOROSCOPIC SCREEN?



ROENTGENOLOGISTS ARE
ENTHUSIASTIC about the
greater brilliancy of the new Patterson Type B Fluoroscopic Screen. Ask any user about this screen. We are quite willing to let his experience guide you.

★

The most convincing evidence we can offer of the superior performance of the new Patterson Type B Fluoroscopic Screen is the actual experience of the many roentgenologists who have put it to every test. ★ These men say that it has greater brilliancy, produces all-around sharper detail, and operates at lower X-ray intensities. ★ Investigate this new Screen. We are confident that it would greatly facilitate your diagnosis. Your dealer would gladly give you a demonstration. ★ The Patterson Screen Company, Dept. C.M.A.J., Towanda, Penna., U.S.A.

Patterson



INTENSIFYING **Screens** FLUOROSCOPIC

SCREEN SPECIALISTS FOR MORE THAN 18 YEARS

ILFORD

X-RAY

FILM

*Meets Every
Radiographic
Requirement*

Ilford X-Ray Film—long popular in England, where it is made—produces radiographs of excellent diagnostic quality.

Radiologists

Who are using Ilford Film pronounce it superior to other brands in point of speed, contrast and detail.

They commend especially the total absence of fog and the remarkable uniformity of its reaction to given exposures.

Complete stocks carried by

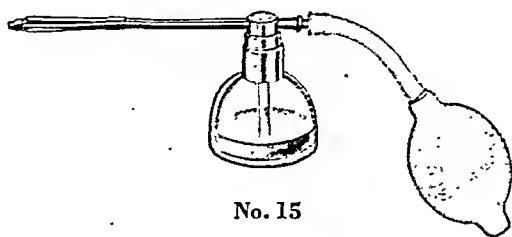
VICTOR X-RAY CORPORATION
of Canada, Ltd.

Distributors for General Electric X-Ray Corporation

MONTREAL—524 Medical Arts Bldg. • WINNIPEG—Medical Arts Bldg.
TORONTO—1221 Bay St., Toronto 5, Ont.

VANCOUVER—Motor Transportation Building, 570 Dunsmuir Street.
Wholesale Warehouse, 389 St. Paul St. W., Montreal, P.Q.

Proper Application is Necessary to Success



No. 15

When you prescribe solutions for the treatment of nose and throat infections, be sure to specify the proper application; otherwise the fullest efficacy is lost. The atomizer thoroughly covers the most remote regions of the nose and throat by diffusing the medicament into thousands of microscopic particles. The new nasal guard, recently developed by DeVilbiss, eliminates any possibility of excess pressure during self-treatment and thus guarantees safety of application. In addition, the atomizer is economical, for where used there is no waste from excess application. Finally, quality construction insures long life even when constantly in service.

DeVilbiss

The DeVilbiss Mfg. Co., Limited, Windsor, Ontario,
headquarters for atomizers and vaporizers
for professional and home use

• Palatable... and non - irritating ... in the treatment of coughs ... grippe ... and bronchitis

There is never any reluctance on the part of children or adults in taking Liquid Peptonoids with Creosote. It is palatable, non-irritating and can be retained by the most sensitive stomach. Clinical test will prove the value of this product as a bronchial expectorant and sedative. The coupon will bring samples and literature.

Liquid Peptonoids with Creosote

THE ARLINGTON
CHEMICAL CO.

YONKERS, NEW YORK



W. LLOYD WOOD, LIMITED,
Canadian Agent,

64-66 Gerrard St. E., Toronto

C.M.J.-8-34

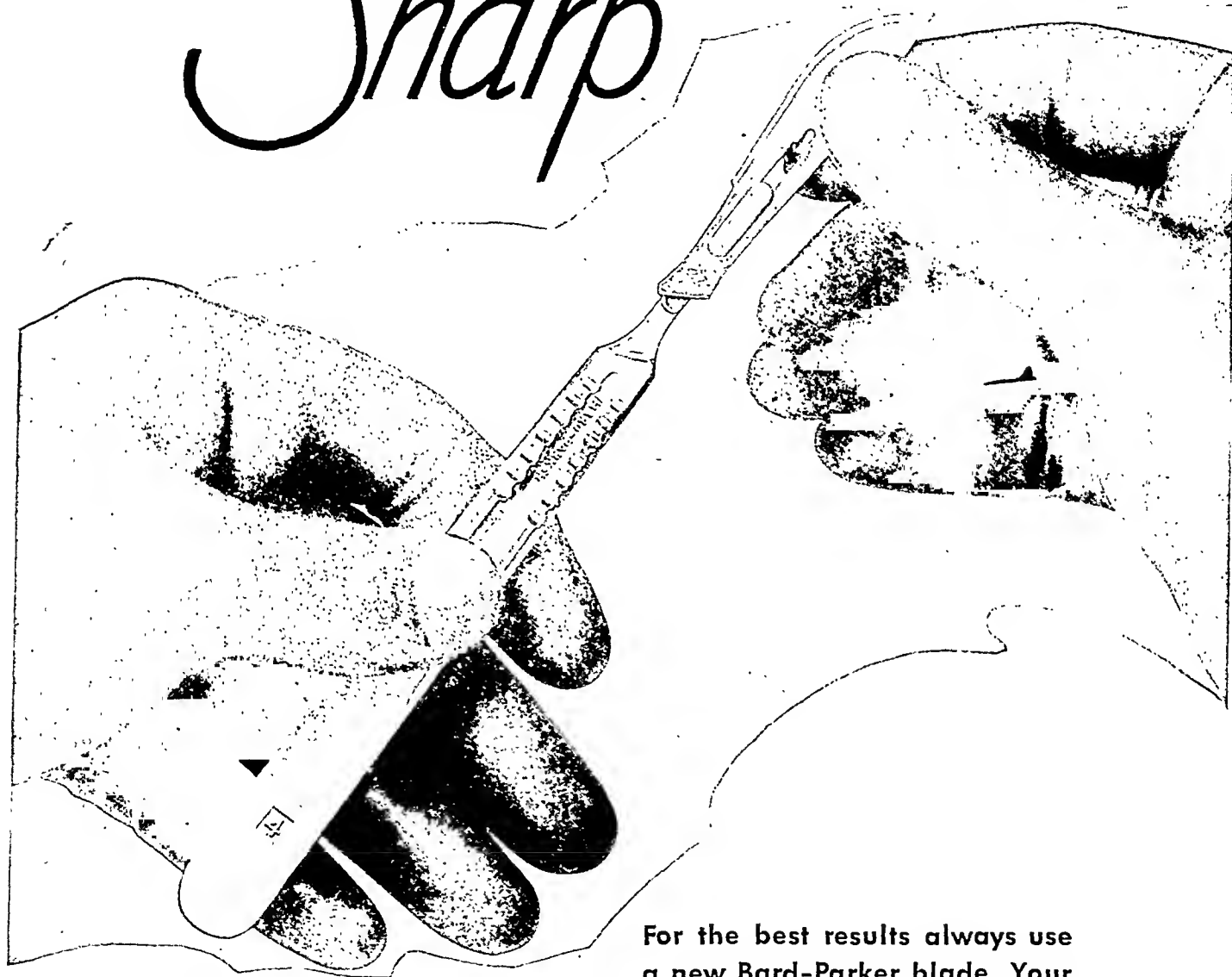
You may send me at the address below
a sample of Liquid Peptonoids with Creosote.

Dr. _____

Address _____

City _____ Prov. _____

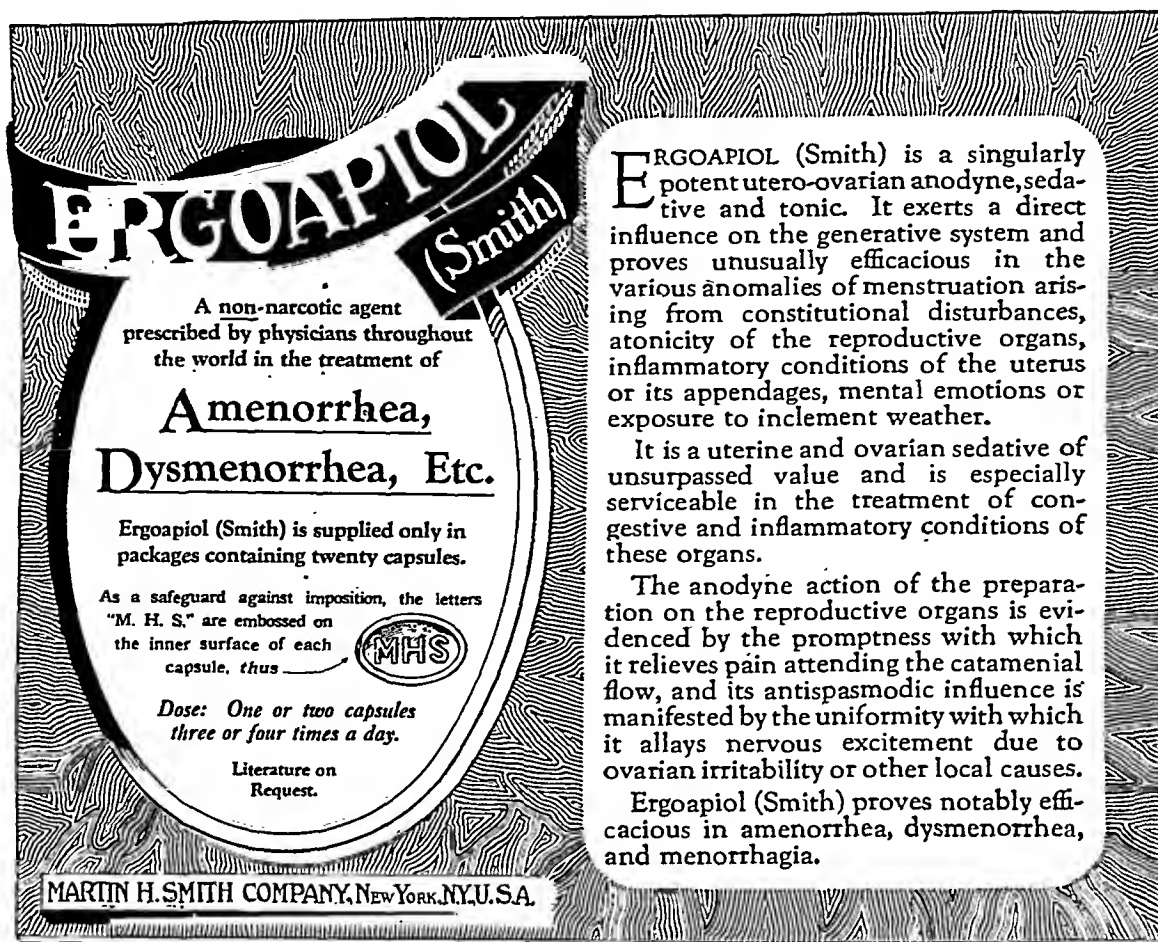
It's Sharp



For the best results always use
a new Bard-Parker blade. Your
dealer keeps a sufficient stock on
hand to supply you at all times.

BARD-PARKER COMPANY, INC.
DANBURY, CONN.

A BARD-PARKER PRODUCT




ERGOAPIOL (Smith)

A non-narcotic agent prescribed by physicians throughout the world in the treatment of

Amenorrhea, Dysmenorrhea, Etc.

Ergoapiol (Smith) is supplied only in packages containing twenty capsules.

As a safeguard against imposition, the letters "M. H. S." are embossed on the inner surface of each capsule, thus 

Dose: One or two capsules three or four times a day.

Literature on Request.

MARTIN H. SMITH COMPANY, NEW YORK, N.Y., U.S.A.

ERGOAPIOL (Smith) is a singularly potent utero-ovarian anodyne, sedative and tonic. It exerts a direct influence on the generative system and proves unusually efficacious in the various anomalies of menstruation arising from constitutional disturbances, atonicity of the reproductive organs, inflammatory conditions of the uterus or its appendages, mental emotions or exposure to inclement weather.

It is a uterine and ovarian sedative of unsurpassed value and is especially serviceable in the treatment of congestive and inflammatory conditions of these organs.

The anodyne action of the preparation on the reproductive organs is evidenced by the promptness with which it relieves pain attending the catamenial flow, and its antispasmodic influence is manifested by the uniformity with which it allays nervous excitement due to ovarian irritability or other local causes.

Ergoapiol (Smith) proves notably efficacious in amenorrhea, dysmenorrhea, and menorrhagia.

A. WANDER LIMITED OPENS TORONTO OFFICE

A. Wander Limited of Peterborough, Canada and London, England, manufacturers of Ovaltine, announce that they have opened an office in Toronto at 7 Adelaide Street West, Room 308. The telephone number is ELgin 9669. A. Wander Limited also have offices in Montreal, Winnipeg and Vancouver.

A QUARTER CENTURY OF SUTURE SPECIALIZATION

Davis & Geek, founded in 1909, with the slogan "This One Thing We Do", has specialized exclusively in the preparation of surgical sutures and devotes its entire energy to maintaining the high standard of excellence which each year has brought D & G sutures nearer to the ideal of perfection. In its study of suture behaviour and in the creation of new products and methods to meet advances in surgery, D & G has enlisted the aid of surgeons, bacteriologists, and chemists of the first rank; and has spared neither effort nor expense in the conduct of specialized research instrumental in raising suture standards. Every scientific development is investigated and those of practical value utilized.

Outstanding among D & G contributions to suture improvement are the Claustro-Thermal method of heat sterilization; the employment of toluol as a tubing fluid in place of the irritative chloroform; the intro-

duction of the double iodide, Kalmerid, in place of the unstable and destructive iodine; the perfection of methods for the reduction and neutralization of chromium; the unification of suture sizes; and the development of digestive absorption tests to supplement *in vivo* controls.

We promise a progressive continuation of the policy and program which have won for us the confidence of the profession whom we have been privileged to serve. (Adv.)

RHEUMATISM

Inflammatory conditions are by no means confined to the winter months, and rheumatism does not govern itself by the calendar. So Antiphlogistine is an all-year therapeutic agent, indicated for and often affording the most grateful relief in the treatment of articular and non-articular rheumatism. The moist heat which it maintains for more than 12 hours, reinforced by the osmotic and phagocytic actions of its chemical constituents, tends to improve the local metabolism, promote absorption of the swellings in and around the muscular fibres, helps to restore movement in stiffened joints and muscles and to bring relief from the pain. Antiphlogistine is indicated for the majority of inflammatory lesions, whether deep-seated or local and those physicians who are not conversant with its uses, or who may wish to give it further clinical trial, are invited to write for samples and literature. The Denver Chemical Mfg. Co., 163 Varick Street, New York, U. S. A. (Adv.)

THROAT IRRITATIONS

As a gargle, you will find Lavioris, diluted with equal parts of hot water, decidedly effective.

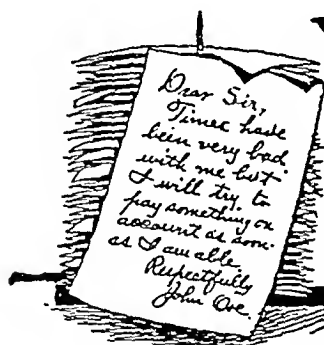
Lavioris will comfort the patient, thoroughly cleanse surfaces and improve tissue tone and resistance.



Professional trial package on request.

MADE IN CANADA BY
LAVORIS CHEMICAL COMPANY
LIMITED
92 JARVIS ST. TORONTO 2, ONT.

DR COLLECTEM



You can't pay
Your bills
with the
other fellows'
Excuses!

But The Medical Audit Association knows how to handle every situation of this kind, Doctor. We turn thousands of excuses into payments. Then, for his share of the proceeds, we mail each doctor a cheque on the Imperial Bank of Canada, Adelaide and Victoria Streets, Toronto.

We were awarded Licence No. "A-1" by The Ontario Securities Commission. For over a decade we have been converting past-due accounts into cash, for your colleagues—all over Canada—quickly and courteously. Mail us your list To-Day!

THE MEDICAL AUDIT ASSOCIATION
44 VICTORIA STREET, TORONTO



DIABETES MELLITUS

Suitable oral organotherapy will control diabetes very definitely when the hyperglycemia is due to the gradual waning of the pancreatic function. Good results may be expected from PAN-SECRETIN, which directly encourages both functions of the pancreas—digestive as well as endocrine.

Available in boxes of 100 sanitablets or capsules. Dose: From 1 to 4 sanitablets q.i.d.

For dependable results prescribe

PAN-SECRETIN

FATIGUE

and

Summer Colds

—just another way of saying hypoadrenia, a condition brought about by continued adrenal stress, usually the end-result of an acute infection. Your patients who complain of fatigue—mental or physical—who are tired all the time, who have colds that hang on from week to week, will respond surprisingly well to 1 sanitablet or capsule q.i.d. of the endocrine tonic formula

ADRENO-SPERMIN

The HARROWER LABORATORY, Inc.

Canadian Distributor:

WILFRED G. NOBLE, LTD.

64 Gerrard St., E. - Toronto, 2

MOLSON'S ALE

FAMOUS FOR PURITY
AND WHOLESOMENESS

SINCE 1786

"You cannot feed
babies with
mathematics



you must feed them with *brains*"
—ABRAHAM JACOBI

These words, uttered some forty years ago by Jacobi, father of American pediatrics, still hold true. You *cannot* feed babies with mathematics. Only by thorough clinical tests and laboratory experimentation, plus the skillful use of the facts gathered by these check-ups, can a good baby food be determined.

For almost twenty years DRYCO has adhered to this commonsense principle. This is one of the reasons why DRYCO is the choice of so many pediatricians, physicians, and obstetricians. They know DRYCO assures *optimum nutrition*, with real living cells, not water logged tissue that *appears* to be solid.

● **DRYCO** contains less (though ample) fat content than natural milk. By the "Just" Roller Process, the remaining fat globules are so reduced and the proteins made so friable that high tolerance and rapid assimilation is certain. For this reason DRYCO is the baby food of choice when routine or concentrated feeding is desired.

● **DRYCO** contains an optimum amount of protein and minerals—especially vital in the fast-growth period.

● **DRYCO** contains a plentiful supply of the necessary Vitamins, particularly Vitamin D, which is transmitted to DRYCO by irradiation.

Feeding babies with DRYCO is feeding them with brains. For optimum nutrition . . . for maximum resistance to diseases of infancy . . . for solid-boned, solid-celled babies . . . try DRYCO clinically. Send for samples and clinical data. They will be forwarded promptly.



DRYCO

Made from superior quality milk from which part of the butterfat has been removed, irradiated by the ultra-violet ray, under license by the Wisconsin Alumni Research Foundation (U. S. Pat. No. 1,680,818) and then dried by the "Just" Roller Process.



THE DRY MILK COMPANY, INC.
DEPT. C.M., 350 MADISON AVENUE, NEW YORK, N. Y.

PSORIASIS

"But doctor,

it's so expensive."

Is it possible to judge the value of medical treatment in dollars and cents?

Can the patient,

ignorant of the curative properties of any preparation pass judgment on its merits.

Naturally

the patient is interested in value received. But — expensiveness should not be governed by initial cost.

RESULTS

should be the important factor in judging any preparation.

The distinctive characteristics of Mazon, together with proved positive results in permanently eliminating stubborn skin conditions, establish Mazon as a more economical treatment than lower priced preparations, many of which afford little or no relief.

Mazon (colloidal) is a combination of Phenolic substances and Dichloramine-T in an absorbent base.

MAZON SOAP

is an important factor of Mazon treatment.

- ABSOLUTELY PURE
- NO ARTIFICIAL COLORING
- NO SYNTHETIC PERFUME
- NO FREE ALKALI
- FOR PERSONAL HYGIENE

INDICATIONS:

ECZEMA
PSORIASIS
ALOPECIA
RING WORM
DANDRUFF
ATHLETIC FOOT
AND OTHER SKIN
DISORDERS

Made in Canada:
LAURENTIAN LABORATORIES
LIMITED
Montreal - Que.

On sale by reliable druggists in
1 - 2 - 4 oz. sizes.



DURATION 15 YEARS
PHOTOGRAPHED JULY 6, 1933



PHOTOGRAPHED AUGUST 1, 1933

PLEASE PRINT

BELMONT LABORATORIES, Inc. C-23
4430 Chestnut St., Philadelphia, Pa.

Gentlemen: Please send me a trial supply of Mazon and Mazon Soap.

Dr. _____

Address _____

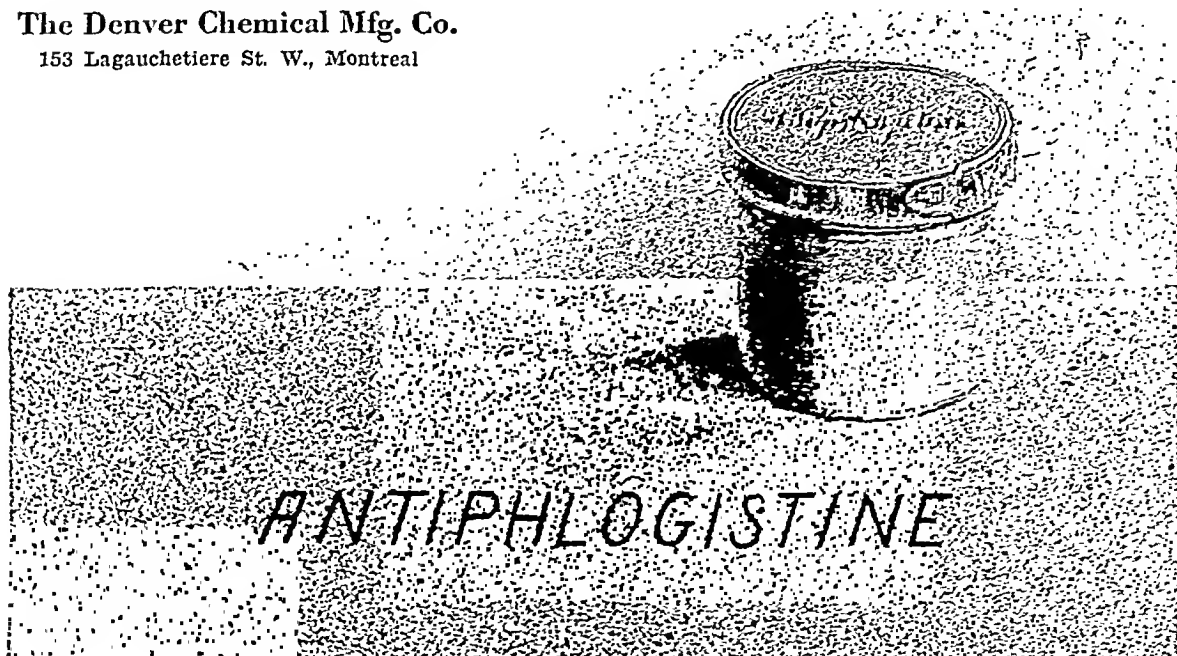
Cervicitis and Endocervicitis

take a prominent place among the conditions which physicians are called upon to treat. ¶ In such cases it is surprising what relief can be given by the insertion of an Antiphlogistine tampon.

¶ By reason of its marked hygroscopic properties, Antiphlogistine causes a pronounced serous exudation, its high glycerine content (45%), the mechanical support, as well as its bacteriostatic, relaxant and heat-retaining powers, are important factors in the successful treatment of these conditions.

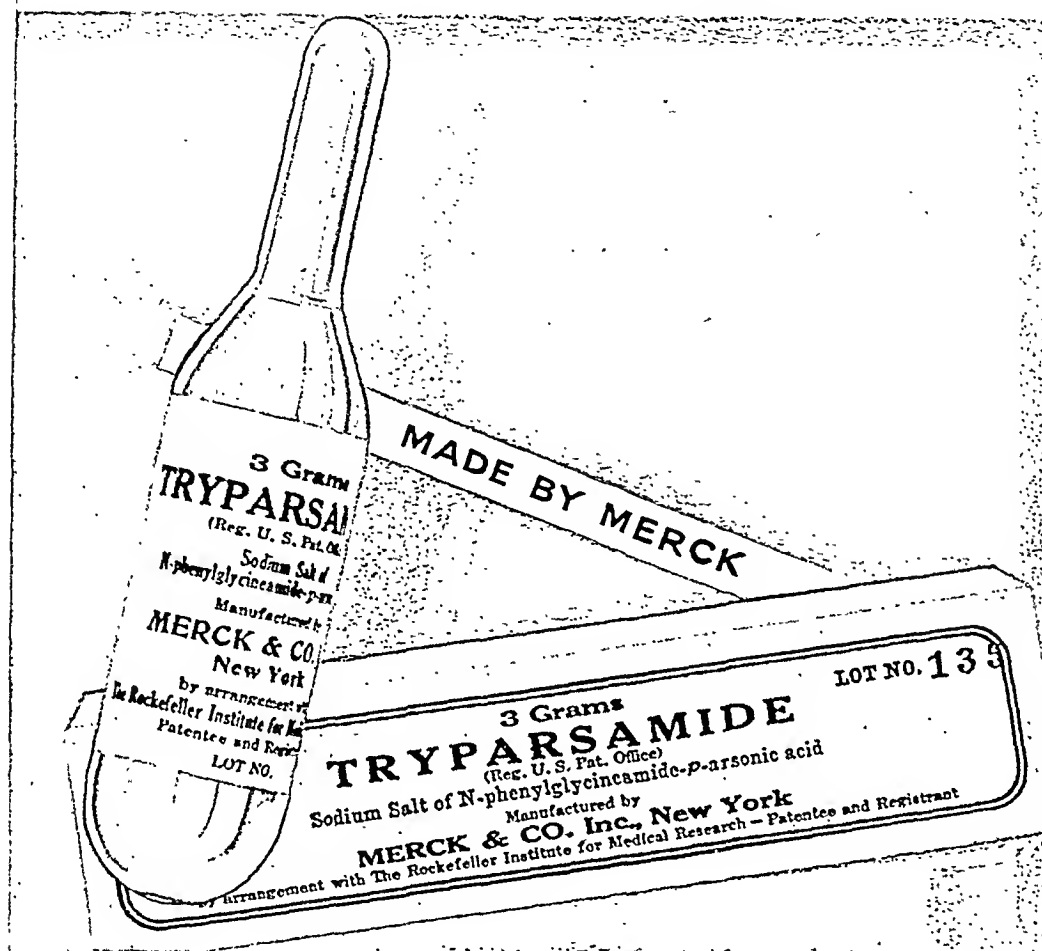
•
*For sample
and literature address*

The Denver Chemical Mfg. Co.
153 LaGauchetiere St. W., Montreal



Made in Canada

Neurosyphilis



what

clinical

reports

indicate

When treating a case of central nervous system syphilis, give the use of Tryparsamide first consideration. With its use in the early, or meningeal type of case, clinical improvement is prompt, and serological improvement usually occurs within the first year.

Tryparsamide is administered intravenously. Its use is an office procedure, does not disrupt the patient's daily routine of life, and is inexpensive.

Clinical reports and treatment methods will be furnished on request.

MERCK & CO. Limited, 412 St. Sulpice St., Montreal.

Tryparsamide

Announcing . . .

A change in name and two welcome improvements in the presentation of Ciba's Surface Analgesic Ointment.

As the registered trade name in Canada and the U.S.A. for the local analgesic agent contained in Percainal, is Nupercaine (in Europe, Percaine) it has been found advisable to change the name of this ointment from Percainal to

Nupercainal "Ciba"

Two improvements in the presentation of Nupercainal "Ciba"

- (1) Nupercainal "CIBA" was formerly issued in a lithographed tube; but now it is offered in plain tubes with an easily-detachable paper label which can be removed before dispensing.
- (2) Each package of Nupercainal "CIBA" will now contain a rectal applicator for employment in internal hæmorrhoids and anal fissures.

When next in need of a surface analgesic ointment, remember Nupercainal "CIBA" is a non-narcotic product, unequalled for the relief of pain and itching in affections of the skin and mucous membranes.

May we send you a complimentary package of Nupercainal "CIBA" in its new presentation?

CIBA COMPANY LIMITED - Montreal

Why Starch of PABLUM Is More Quickly Digested than that of Long-cooked Cereals

FOR many years it has been the custom to cook infants' cereal one, two, and even three hours to increase its digestibility. This bothersome and expensive long cooking is proven unnecessary with Pablum. For, being pre-cooked at 10 pounds steam pressure and dried, it is so well cooked that it can be served simply by adding water or milk of any temperature. Photomicrographs and also digestibility studies *in vitro* give evidence of this thorough cooking.

Fifteen cereals (both cooked and uncooked) studied microscopically were revealed as containing many starch granules, most of them massed into dense clumps. *Such unruptured clumps were never observed in hundreds of examinations of Pablum.* The latter consists, rather, of porous flakes which, like sponges, drink up liquids. Hence Pablum can be entirely saturated by the digestive secretions. This is borne out by studies of Ross and Burrill who found that the starch of Pablum is more rapidly digested than that of ordinary cereals cooked 4 hours.

Table shows that maltose production is much greater for Pablum prepared with cold water than for other cereals cooked 4 hours. Ross and Burrill (J. Pediat., May 1934) conclude from this and from the total soluble carbohydrate formed that starch digestion of Pablum is more rapid than that of 6 other cereals.

WHOLE WHEAT

OATMEAL

CORNMEAL

FARINA

Cooked
4
Hours

PABLUM

Prepared with
cold water

40 80 120 160 200
MG. MALTOSE PRODUCED

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons



140 X. STAINED

(INSET) 290 X. STAINED

Large photomicrograph: Pablum mixed with cold water—portion of large flake. Pablum flakes are honeycombed with "pores" or air-spaces (note light areas). This porosity permits ready absorption of digestive fluids by the entire flake. No starch granules appear—they have been completely ruptured.

Inset: Farina cooked ½ hour—clump of tissue including starch granules. Note density of clump and lack of porosity. Many starch granules, such as are present in raw cereal, remain unchanged in form.

BESIDES being thoroughly cooked and readily digestible, Pablum supplies essential vitamins and minerals, especially vitamins A, B, E, and G, and calcium, phosphorus, iron, and copper. It is a palatable cereal consisting of wheatmeal, oatmeal, cornmeal, wheat embryo, alfalfa leaf, beef bone, brewers' yeast, and salt.

Reprint of Ross and Burrill paper sent on request of physicians.

MEAD JOHNSON & COMPANY
of Canada, Ltd., Belleville, Ont.

THESE FORMULAS GIVE GRATIFYING RESULTS IN INFANT FEEDING



WITH MILK AND WATER

The addition of Hylac to fluid cow's milk and water results in formulas approaching natural balance.



WITH WATER ALONE

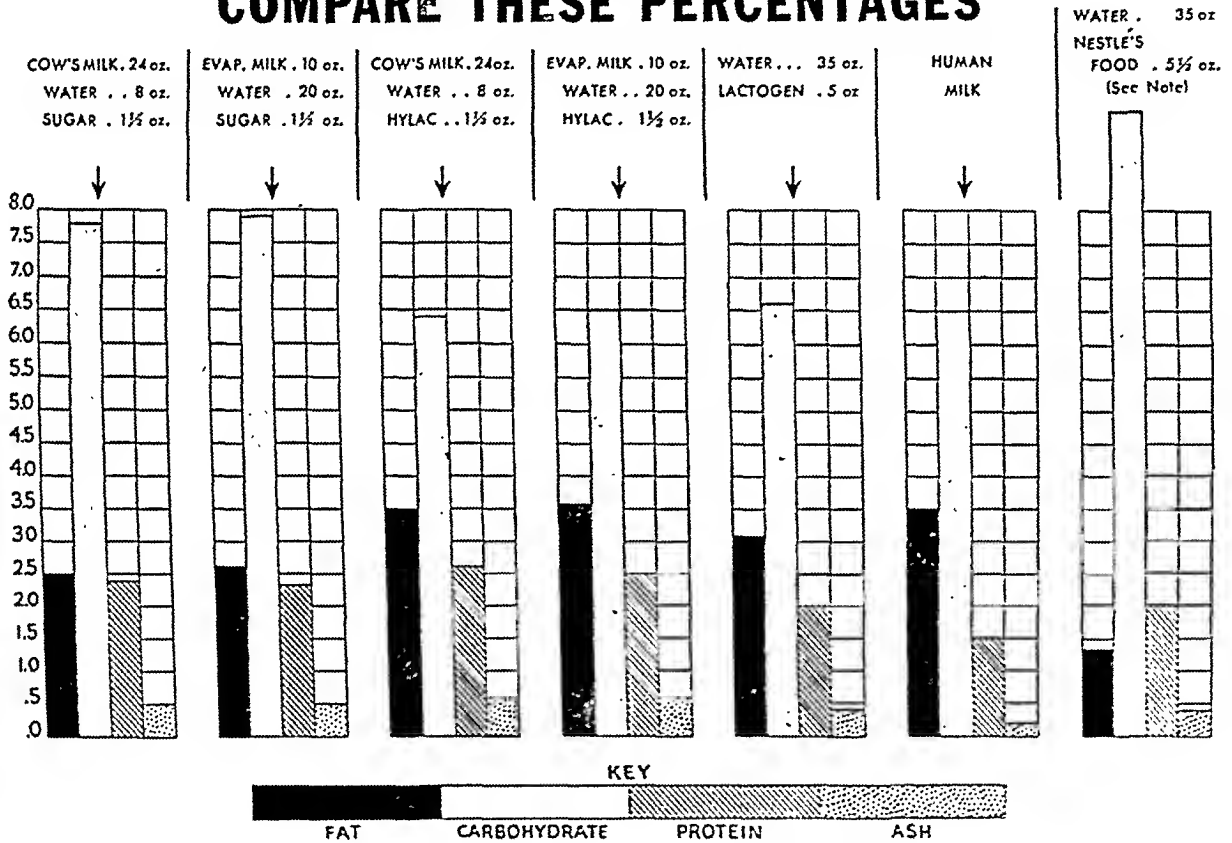
A dried milk formula with all the advantages of properly modified cow's milk, plus increased digestibility.



WITH WATER OR MILK

A low fat, high mixed carbohydrate formula for infants who cannot tolerate formulas approaching natural balance.

COMPARE THESE PERCENTAGES



NOTE: — The above Nestlé's Food formula does not resemble human milk because it is designed for infants who cannot tolerate formulas which approach natural balance.



Accepted by the Committee on Foods of the American Medical Association

None of the above products is advertised to the laity. No feeding directions are given except to physicians. All three products have been accepted by the Committee on Foods of the American Medical Association. For free samples and literature mail your professional blank to:—

NESTLÉ'S MILK PRODUCTS (Canada) Limited

Metropolitan Building

Department A934

Toronto, Ont.

The Canadian Medical Association Journal

Editor, A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C.)

3640 University Street, Montreal

Vol. 31

SEPTEMBER, 1934

No. 3

Contents

	Page		Page
Supplement	i	Fundamentals in Rectal Diagnosis. <i>E. A. Daniels</i> . .	289
Experimental Silicosis: Quartz, Sericite and Irritating Gases. <i>W. D. Robson, D. A. Irwin and E. J. King</i>	237	The Treatment of Dietary Anæmia. <i>C. E. Snelling</i> . .	294
Silica Dust. <i>W. R. Franks</i>	245	Spinelli Operation Followed by Pregnancy and Labour. <i>W. P. Tew</i>	297
Cystinuria and Cystine Lithiasis. <i>F. S. Patch</i>	250	The Rôle of the Pathologist in the Diagnosis of Cancer. <i>W. L. Robinson</i>	298
Xanthomatosis and the Schüller-Christian Syndrome: A Roentgenological and Clinical Study. <i>S. Reich</i>	256		
Common Duct Obstruction with Lipiodol Studies of Cholangiectasis and the Effects of Prolonged Drainage. <i>P. H. T. Thorlakson and J. C. McMillan</i>	265		
Gonococcal Endocarditis. <i>W. W. Eakin</i>	269		
Benign Epithelial Invasion. <i>W. Boyd</i>	273		
One Thousand Avertin Anæsthesias. <i>W. Bourne and P. E. O'Shaughnessy</i>	276		
Corrective Measures for Progressive Deafness. <i>G. Berry</i>	284		

CASE REPORTS

Pituitary Extract in the Treatment of Alopecia. <i>A. W. M. White</i>	301
A Vaseline Bottle in the Rectum. <i>W. F. Gillespie</i> . .	302
An Ink Bottle in the Rectum. <i>H. G. Pretty</i>	302

EDITORIAL

Recent Studies on Silicosis	304
The Influence of the Hypophysis in Hypertension. . .	30

CONTINUED ON PAGE IV

GOLD THERAPY in Pulmonary Tuberculosis

For intravenous administration

CRISALBINE

Gold Sodium Thiosulphate

This treatment is indicated both in cases where the disease is active, and in cases where the lesions may be said to be dormant.

Recent results show its action is more effective in the *recent exudative type* of case than in the *fibrotic form* of pulmonary tuberculosis.

The reaction to this treatment is usually very mild, thus ambulatory treatment can be used.

Supplied in ampoules of 0.05 Gm, 0.10 Gm, 0.20 Gm, 0.25 Gm, 0.50 Gm.

For intramuscular administration

MYOCHRYSINE

Sodium Aurothiomalate

Recommended for cases where the Patient is particularly sensitive to gold and where intravenous injection complicates the treatment.

Myochrysine is of low toxicity, stable in aqueous solution, and can be injected intramuscularly, where it is well tolerated and rapidly absorbed.

Supplied in *aqueous solution* or in *oily suspension* as follows:— 0.01 Gm, 0.05 Gm, 0.10 Gm, 0.20 Gm, 0.30 Gm, 0.50 Gm.

NOTE:— CRISALBINE and MYOCHRYSINE are also indicated in the treatment of LUPUS ERYTHEMATOSUS. The technique and dosage recommended are approximately those indicated for the treatment of pulmonary tuberculosis.

LABORATORY POULENC FRÈRES OF CANADA LIMITED

Selling Agents:—

ROUGIER FRÈRES : - : 350 Lemoine Street West : - : MONTREAL

"SYNTHETIC" Brand Products for the Treatment of SYPHILIS

Novarsan (914) Powder
Novarsan (914) Combination
Novarsan (914) Solution
Diarsenol (606)
Sulpharsphenamine
Sulpholeum
Metallic Bismuth
Metallic Bismuth Cream
Bismuth Oxychloride
Bismuth Tartrate
Mercury Salicylate
For Arsenical Poisoning
Sodium Thiosulphate

First producers of arsphenamines on the North American Continent and the British Empire.

Treat SYPHILIS with NOVARSAN COMBINATION (914)

A package containing an ampoule of Novarsan Powder and an ampoule of special solvent. A uniform neoarsphenamine product of the highest therapeutic activity plus a solvent which lowers the toxicity by at least one-half.

and METALLIC BISMUTH Brand "Synthetic"

Pure Bismuth metal in glucose suspension, put up in convenient rubber capped bottles. Painless—convenient—potent—economical.

Literature on request

Manufactured in Canada by

SYNTHETIC DRUG COMPANY LIMITED
243 College Street - Toronto - Canada
Midway 8055

CONTENTS CONTINUED FROM PAGE II

	Page		
EDITORIAL COMMENTS		TOPICS OF CURRENT INTEREST	
The Reorganization of our Association	307	The Sale of Contraceptives	
Canada and the Traffic in Narcotic Drugs	308	The Depression Restoring the General Practitioner	
The Uncertainty of Dr. Robert G. Jackson's Age	309	A Cheaper Process of Making Cyclopropane	
Dr. A. P. Procter	309	ABSTRACTS FROM CURRENT LITERATURE	
Errata	309	Medicine	
SPECIAL ARTICLES		Surgery	
The Search for Heart Remedies. <i>E. Podolsky</i>	310	Obstetrics and Gynaecology	
MEDICAL ECONOMICS		Pathology and Experimental Medicine	
Alberta Notes	315	Therapeutics	
NOTES ON THE BRITISH PHARMACOPOEIA AND CANADIAN FORMULARY		Hygiene and Public Health	
For the Ophthalmologist	316	Urology	
The Biologically Standardized Galenicals	316	Ophthalmology	
The Biological Products of the British Pharmacopoeia	317	Neurology and Psychiatry	
ASSOCIATION NOTES		Dermatology	
The Calgary Meeting: Proceedings of the Sections and General Sessions	317	Anæsthesia	
SPECIAL CORRESPONDENCE		OBITUARIES	
The Edinburgh Letter	321	T. P. Bradley	335
The London Letter	322	A. P. Cartier	335
LETTERS, NOTES AND QUERIES		R. Crosby	335
The Department of Pensions and National Health and the Canadian Medical Association	323	J. E. Daignault	335
		L. Doray	335
		A. T. Fuller	335
		T. S. Genge	335
		G. Gernon	
		G. S. Glassco	
		H. Howitt	
		L. Legault	
		V. J. Levasseur	
		T. McCurdy	
		F. S. Vrooman	
		NEWS ITEMS	
		Great Britain	336
		Canada	336
		United States	
		Book Reviews	

Printed by MURRAY PRINTING COMPANY, LIMITED, 192 SPADINA AVENUE, TORONTO 2.

IN PERTUSSIS—

Your problem is

—To ease and diminish the severity of the paroxysms

—To shorten duration of the disease

—To prevent complications

That is exactly what

ANGIER'S EMULSION

will do if prescribed in teaspoonful doses (either clear or in tablespoonful of warm water or milk) every two hours.

The irritated membrane is soothed and kept moist by the Emulsion. It loosens the secretions, facilitates expectoration, supplies calcium and phosphorus benefits. It also affords the cleansing, lubricating action of its mineral oil base.

Samples gladly sent on request

WINGATE CHEMICAL CO. LTD.

378 West St. Paul St., Montreal, Que.

Gentlemen:— Kindly send me free sample of Angier's Emulsion.

Name _____

Address _____

Canadian Distributors:

The Wingate Chemical Co., Ltd.

378 St. Paul St., West - Montreal, Que.

PAVACODEINE

C. T. No. 301 "Frosst"

R Papaverine hydrochloride $\frac{1}{4}$ gr.
Codeine phosphate $\frac{1}{4}$ gr.

ACETOPHEN AND PAVACODEINE

C. T. No. 321 "Frosst"

R Acetophen 5 grs.
Papaverine hydrochloride $\frac{1}{4}$ gr.
Codeine phosphate $\frac{1}{4}$ gr.

DEFINITE
IMPROVEMENT
IN
75%
OF
COMMON COLDS
IN FROM 24 TO 48 HOURS

*Literature and method of treatment is
presently being mailed to all physicians*

Charles E. Frosst & Co.

MANUFACTURING PHARMACISTS SINCE 1899

TORONTO

MONTREAL

RICHMOND, VA.

The Canadian Medical Association Journal

The Official Organ of the Canadian Medical Association and of all Provincial Medical Associations of Canada

Editorial Office, 3640 University St. - Montreal

CENTRAL EDITORIAL BOARD

Editor, A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., F.R.C.P.(C).

Assistant Editor, H. E. MacDermot, M.D., F.R.C.P.(C).

Managing Editor, F. S. Patch, M.

Maude E. Abbott; E. W. Archibald; A. T. Bazin; F. G. Finley; A. Grant Fleming; H. M. Little; C. F. . . .

J. C. Meakins; L. C. Simard

CORRESPONDING MEMBERS

J. W. Crane; P. C. Dagneau; N. B. Dreyer; J. G. FitzGerald; J. Miller; Ross Mitchell; Alan Rankin.

CHAIRMEN OF PROVINCIAL EDITORIAL BOARDS

ALBERTA—G. E. Learmonth, Calgary.

BRITISH COLUMBIA—C. H. Bastin, Vancouver.

MANITOBA—Ross Mitchell, Winnipeg.

NEW BRUNSWICK—A. S. Kirkland, Saint John.

NOVA SCOTIA—

ONTARIO—J. H. Elliott, Toronto.

P. E. ISLAND—J. A. McPhee, Summerside.

SASKATCHEWAN—Lillian Chase, Regina.

MEMBERSHIP including *Journal*, \$10.00. Subscription to *Journal* is \$6.00 and is limited to Librarians. Hospitals and doctors residing outside Canada. Volume commences with January and July Issues. Index in J. and December Issues.

CONTRIBUTIONS

EXCLUSIVE PUBLICATION: Articles are accepted for publication on condition that they are contributed solely to this *Journal*. Arrangements for simultaneous publication may be made under exceptional circumstances.

COPYRIGHT: Matter appearing in the *Journal* is covered by copyright under the Copyright Act of 1921 but, as a general rule, no objection will be made to the reproduction in reputable medical journals of anything in these columns, provided proper credit is given.

MEMORANDUM FOR CONTRIBUTORS

MANUSCRIPTS: Should be *typewritten, double-spaced*, and the *original copy* submitted, otherwise they cannot be accepted.

REFERENCES: Should be arranged as follows:

In the case of a Journal: ROBINSON, A. L.: Exophthalmic goitre, *J. Am. M. Ass.*, 1919, 72: 1327. The black face type (72:) stands for the volume. In a typewritten manuscript the volume number should be underlined.

In the case of a book: KLEIN, *Micro-organisms of Disease*, Macmillan, London, 1st ed., 1896, p. 151.

Bibliographies are tending to become so cumbersome that frequently the *Journal* has to omit them for lack of space. Contributors are asked to give only the most important references.

ILLUSTRATIONS: Will be paid for by us when satisfactory photographs or drawings are supplied by the author. Negatives are not acceptable. Each illustration, table, etc., should bear the author's name on the back. Photographs should be clear and distinct, preferably black and on glazed paper; drawings should be made in india ink on white paper. For illustrations requiring cuts the best copper plate is used and all are printed on glazed paper. The *Journal* reserves the right to limit the number of illustrations. Contributors are respectfully requested to limit illustrations to such as are absolutely necessary.

REPRINTS: These may be ordered by contributors from the printers upon the form submitted with the galley proof.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. Advertising rates on request.

N.B.—We endeavour to exclude from our columns all unethical advertisements and appreciate notification from our readers relative to any misrepresentation.

CLASSIFIED ADVERTISEMENTS are payable in advance. To avoid delay in publishing, remit with order. Advertisements under the following headings cost \$2.00 for each insertion of 40 words or less, additional words 5 cents each.

WANTED: Apparatus, Assistant, Books, Location, Partner, Partnership, Situation.

FOR SALE: Apparatus, Practice, Sanitaria, Drug Stores.



OVERSHADOWING THE GLORY

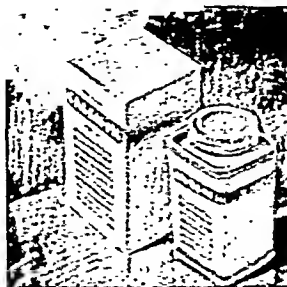
Those who glorify the maternal state in words, are not, as a rule, the mothers-to-be. Pregnancy has too many immediate discomforts overshadowing its glory. Nausea of pregnancy can make the sufferer thoroughly miserable.

Experience, renowned as the Reliable Teacher, singles out CAL-BIS-MA as a very efficient gastric sedative in nausea. It not only neutralizes the excess acid in the stomach, but exerts a soothing, sedative, protective action upon the mucous membrane of the digestive system. Sodium bicarbonate, magnesium and calcium carbonates, bismuth and *colloidal kaolin*, in a colloid base, combine in Cal-Bis-Ma to give quick and lasting relief in every gastric condition characterized by hyperacidity.

There is no distention from gas with Cal-Bis-Ma, for the colloidal kaolin adsorbs the gas formed by the acid-alkali reaction. That is why Cal-Bis-Ma is safe to use in gastric ulcer.

Trial supply sent on request. Please use letterhead.

For gastric hyperacidity **CAL-BIS-MA**



Cal-Bis-Ma (powder) is supplied in tins (with removable label) containing 1½ and 4 ounces, and one pound. The dose is one or two teaspoonsful in water.

The Canadian Medical Association

Affiliated with the British Medical Association

Patron: HIS ROYAL HIGHNESS THE PRINCE OF WALES

President—J. S. McEachern, Calgary.

President-Elect—J. C. Meakins, Montreal.

Chairman of Council—G. S. Young, Toronto.

Honorary Treasurer—F. S. Patch

Editor—A. G. Nicholls

3640 University Street, Montreal.

General Secretary—T. C. Routley, 184 College Street, Toronto.

Associate Secretaries—G. Harvey Agnew, Toronto; A. Grant Fleming, Montreal.

THE COUNCIL

G. S. Young, Toronto, *Chairman*

J. D. Adamson, Winnipeg	R. W. L. Earle, Perth, N.B.	T. A. Lebbetter, Yarmouth	John Oille, Toronto
G. A. B. Addy, Saint John	G. S. Fahrni, Winnipeg	Geo. Lee, Shannavon	John Palmer, Calgary
G. Harvey Agnew, Toronto	H. A. Farris, Saint John	Forrest Leeder, Victoria	F. S. Patch, Montreal
J. F. Argue, Ottawa	J. G. FitzGerald, Toronto	A. LeSage, Montreal	R. K. Paterson, Ottawa
B. C. Armstrong, Medicine Hat	A. G. Fleming, Montreal	D. Low, Regina	R. M. Pendrigh, Saint John
H. B. Atlee, Halifax	J. T. Fotheringham, Toronto	J. S. McEachern, Calgary	E. L. Pope, Edmonton
L. J. Austin, Kingston	Léon Gérin-Lajoie, Montreal	A. J. McGanity, Kitchener	R. W. Powell, Ottawa
F. G. Banting, Toronto	G. M. Gibson, Drumheller	W. H. McGuffin, Calgary	A. Primrose, Toronto
C. A. Barager, Edmonton	J. C. Gillrie, Fort William	D. W. McKay, Nelson	F. W. Routley, Maple
J. M. Barry, Saint John	Duncan Grabam, Toronto	R. E. McKechnie, Vancouver	T. C. Routley, Toronto
Gordon Bates, Toronto	H. G. Grant, Halifax	J. W. McKenzie, Charlottetown	E. S. Ryerson, Toronto
W. J. Bell, Toronto	Harold Griffith, Montreal	K. G. McKenzie, Toronto	E. P. Scarlett, Calgary
J. E. Bloomer, Moose Jaw	S. E. Grondin, Quebec	Murray MacLaren, Ottawa	H. B. Small, Ottawa
R. B. Boucher, Vancouver	J. A. Gunn, Winnipeg	Helen MacMurphy, Toronto	Emerson Smith, Edmonton
Wesley Bourne, Montreal	J. N. Gunn, Calgary	Daniel McNeill, Glace Bay	W. Harvey Smith, Winnipeg
M. R. Bow, Edmonton	N. MacL. Harris, Ottawa	J. F. McNeill, Summerside	Ralph Smith, Halifax
G. S. Cameron, Peterborough	A. K. Haywood, Vancouver	Alex. McPhedran, Toronto	G. D. Stanley, Calgary
A. B. Campbell, Bear River, N.S.	J. J. Heagerty, Ottawa	D. C. Malcolm, Saint John	J. Stevenson, Quebec
P. M. Campbell, Lethbridge	V. E. Henderson, Toronto	C. F. Martin, Montreal	D. A. Stewart, Ninette
H. H. Chown, Winnipeg	W. B. Hendry, Toronto	J. C. Meakins, Montreal	G. F. Strong, Vancouver
H. H. Christie, Esterhazy	J. Hepburn, Toronto	H. H. Milburn, Vancouver	E. T. Tanton, Summerside
Col. J. T. Clarke, Ottawa	W. H. Hill, Calgary	Ross Mitchell, Winnipeg	P. H. T. Thorlakson, Winnipeg
M. G. Cody, Calgary	C. P. Howard, Montreal	E. W. Montgomery, Winnipeg	Ethlyn Trapp, Vancouver
R. J. Collins, Saint John	F. H. Hurlburt, North Battleford	B. R. Mooney, Edmonton	E. Trottier, Montreal
L. C. Conn, Edmonton	O. M. Irwin, Swift Current	E. S. Moorhead, Winnipeg	W. S. Turnbull, Vancouver
N. B. Coward, Halifax	F. W. Jackson, Winnipeg	Daniel Murray, Tatamagouche, N.S.	G. C. VanWart, Fredericton
H. B. Cushing, Montreal	Heber Jamieson, Edmonton		G. J. Wherrett, Ottawa
P. C. Dagneau, Quebec	I. W. Jardine, Kensington		S. W. Williamson, Yarmouth
W. A. Dakin, Regina	G. R. Johnson, Calgary		Ward Woolner, Ayr
V. D. Davidson, Saint John	A. S. Kirkland, Saint John	F. C. Neal, Peterborough	C. F. Wyld, Montreal
C. N. DeBlois, Three Rivers	W. J. Knox, Kelowna	A. G. Nicholls, Montreal	A. MacG. Young, Saskatoon
H. E. Eaglesham, Weyburn	P. H. LaPorte, Edmundston, N.B.	Daniel Nicholson, Winnipeg	Geo. S. Young, Toronto
	A. D. Lapp, Tranquille	J. R. Nugent, Saint John	

EXECUTIVE COUNCIL

George S. Young, Toronto, <i>Chairman</i>	J. G. FitzGerald, Toronto	J. S. McEachern, Calgary	F. S. Patch, Montreal
A. T. Bazin, Montreal	Léon Gérin-Lajoie, Montreal	K. A. MacKenzie, Halifax	A. Primrose, Toronto
J. E. Bloomer, Moose Jaw, Sask.	Duncan Graham, Toronto	J. C. Meakins, Montreal	T. C. Routley, Toronto
	W. J. Knox, Kelowna	A. G. Nicholls, Montreal	W. Harvey Smith, Winnipeg
			C. J. Veniot, Bathurst, N.B.

Rather than the Bromides—use

BROMURAL

Alphabromisovalerylurea

Council Accepted

Soothes the Nerves, Induces Refreshing Sleep

DOSE: 1 to 3 Tablets, 5 grains each.

Literature and Samples from

MERCK & CO. Ltd., 412 St. Sulpice St., MONTREAL - Selling Agents

Manufacturers: Bilhuber-Knoll Corp., Jersey City, N. J.

Resistance to infection

Post-influenzal debility

Experience in general practice shows that

MARMITE

(Registered Trade Mark)

is an effective agent for increasing the resistance to infections of all kinds, and that it exerts a marked tonic action which is distinctly beneficial in convalescence and in post-influenzal debility.

Marmite-- the well-known yeast extract--is recognized as the best source of the B Vitamins; it is now being prescribed extensively for its anti-anæmic properties as well as for its prophylactic and therapeutic effect in many common diseases.

In Jars: 2 oz., 4 oz., 8 oz., 16 oz. and 7 lb. tins.

SPECIAL QUOTATIONS FOR SUPPLIES IN BULK TO HOSPITALS AND INSTITUTIONS



Sample and Literature on Application to:

THE MARMITE FOOD EXTRACT CO., LTD.

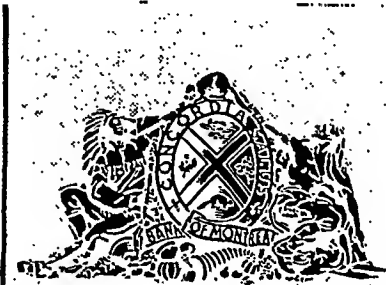
Walsingham House, Seething Lane, London, E.C. 3.

or to

MacLAREN-WRIGHT, LTD., 69 Front St. East, Toronto

Canadian Distributors

TOTAL ASSETS
IN EXCESS OF
\$700,000,000



An institution which
for over 116 years has
provided complete do-
mestic and foreign bank-
ing service for Canadians.

BANK OF MONTREAL

Established 1817

DUNCAN, FLOCKHART & CO.

EDINBURGH AND LONDON

have appointed

MESSRS. INGRAM & BELL LTD.

to represent them throughout CANADA for their well known specialties:

CHLOROFORM
OPHTHALMIC CAPSULES

MEDICINAL CAPSULES
ADRENALIN SOLUTION, ETC.

MESSRS. INGRAM & BELL will carry a comprehensive stock of these products at their various places of business throughout Canada—Toronto, Montreal, Winnipeg, Calgary—and prompt delivery of all orders is guaranteed to any part of the Dominion.

These all-British products are confidently recommended as representing the safest and most effective Pharmaceutical Specialities of their kind, and they can be used and prescribed with the certain knowledge of prompt and effective clinical action.

Your continued interest in these products is solicited and will be greatly appreciated.

TYPES of Petrolagar

All of which are Council-Accepted

To enable the physician to fit the treatment to the particular need of the patient, these five types afford a range of laxative potency which will meet practically every requirement of successful bowel management.


Petrolagar is 65 per cent (by volume) liquid petrolatum of most rigid specifications, emulsified with "Number One, Silver White, Kobe Agar-agar."



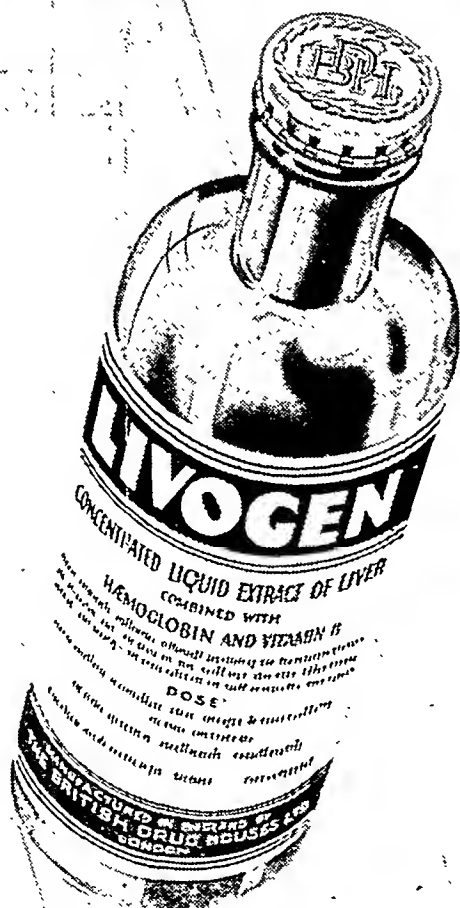
Samples Free on Request

Petrolagar Laboratories of Canada,
Ltd.

103 OTTAWA ST.,
WALKERVILLE, ONTARIO



LIVOCEN



The revitalising tonic which physicians everywhere are finding so valuable in the treatment of many vague conditions of subnormal health which are often extremely difficult of exact diagnosis.

Stocks are held by leading druggists throughout the Dominion, and full particulars are obtainable from—

**THE BRITISH DRUG HOUSES
(CANADA) LTD.**

Terminal Warehouse — Toronto 2, Ont.

Lgn/Can/3409

COLLOIDAL ADSORPTION IN THE STOMACH

COLLOIDAL ADSORPTION IN THE BOWEL

KAOMAGMA



Kaomagma offers a fluid, palatable, stabilized suspension of colloidal kaolin 20%, rendered more actively adsorbent by dispersion in neutral alumina gel (colloidal hydrate of alumina) 2½%.

Overcomes the objections to crude kaolin, as well as increasing the adsorptive effect.

Increased efficiency is due to the peptizing action of alumina gel upon the particles of kaolin, which gradually intensifies the adsorptive action both in the stomach and in the intestines.

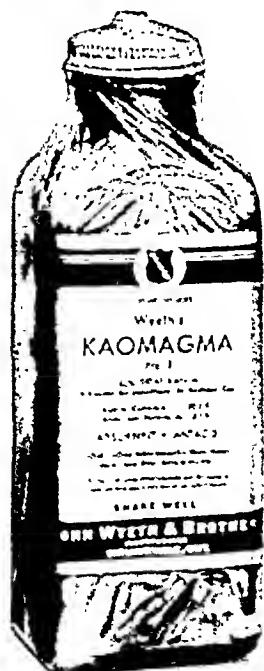
Kaomagma adsorbs excess acid in the stomach, helps remove the cause of irritation and ulceration, exercises a soothing protective effect on the mucosa.

Kaomagma adsorbs gas, bacteria, toxins, in the treatment of intestinal putrefaction and flatulency.

Write for clinical sample and literature

JOHN WYETH & BROTHER, INC.

Walkerville, Ontario



JOHN WYETH & BROTHER, INC.
103 Ottawa Street,
Walkerville, Ontario.

Dept. C A 9

Gentlemen: Please send me sample of Kaomagma for clinical test, together with literature.

Dr.

Address

City

Province

SQUIBB COD-LIVER OIL PRODUCT



Squibb Cod-Liver Oil has an exceptionally high Vitamin A and D potency, in which respect it is unexcelled by any product on the market. Each gram contains not less than 1750 U.S.P. Rev. 1934 (International) Vitamin A units and 200 U.S.P. (International) Vitamin D units. It is supplied plain and mint-flavoured.

Squibb Cod-Liver Oil with Viosterol

It contains not less than 1750 U.S.P. Rev. 1934 (International) Vitamin A units and 400 U.S.P. (International) Vitamin D units. It is supplied either plain or mint-flavoured.

Provide High Dependable Potency

Not all cod-liver oil products have the same content of Vitamins A and D. It is therefore essential to select a cod-liver oil with high, guaranteed potency if maximum results are to be obtained. Hundreds of physicians recommend Squibb Cod-Liver Oil because they recognize its value in promoting growth, calcium assimilation and good, general resistance.

Squibb Cod-Liver Oil Products are prepared under conditions which assure an exceptionally high vitamin content. They are refined and bottled under carbon dioxide to guarantee maximum stability and to prevent changes in the products which affect the taste.

For literature write

*E. R. Squibb & Sons of Canada Ltd.,
36 Caledonia Road, Toronto.*

E. R. SQUIBB & SONS OF CANADA, Ltd.
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858.



Sleep—
calm and restorative
easily induced



by ⁶⁶MEDINAL-ELIXIR⁹⁹

Delightfully palatable



ORIGINAL PACKINGS

ELIXIR: bottles of 6 fluid ounces
 POWDER: bottles of 1 oz. & 4 ozs.

TABLETS: tubes of 10 and bottles of 100 & 250 tablets
 of 5 and 7½ grains each

SCHERING (Canada) Ltd., P. O. Box 358, Montreal .



The Newest Agent for Subduing Pain

- **NOVALDIN** has not only proved to be a very active analgesic but is also characterized by a high safety index. Its ready solubility enables it to be given orally in solution or by intramuscular injection (ampules). The scope of usefulness of Novaldin covers all painful conditions; especially headache, neuralgias, articular and muscular rheumatism, chronic arthritis, influenza and colds.

DOSE: Adults 1 or 2 tablets. Children, $\frac{1}{2}$ or 1 tablet. For intramuscular injection, 1 ampule (2 cc.).

N.O.V.A.L.D.I.N.

RECOMMENDED BY THE CANADIAN
Board of DIPYRONE

(Sodium phenylmethylethercarbamol methylaminomethane sulphate)

Supplied in 5 grain tablets, tubes of 10 and bottles of 100, for oral use; and in 2 cc. ampules, boxes of 5, for injection.



WINTHROP CHEMICAL COMPANY, INC.

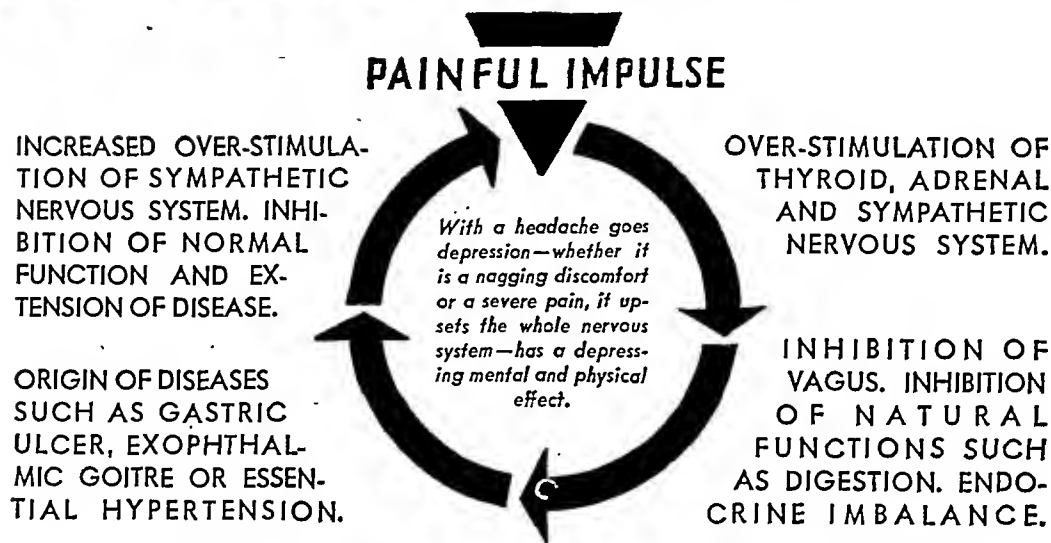
Pharmaceuticals of Merit for the Physician

907 Elliott Street West, Windsor, Ont.

No. 7 of a Series of Advertisements prepared in the Interest of Acetanilid B.P. by Bromo-Seltzer, Ltd.

PAIN

A VICIOUS CIRCLE



Cannon has shown how pain overstimulates the adrenals and sympathetic nervous system and inhibits the vagus together with normal functions such as digestion, which may be delayed for several hours.

Crile contends that the overstimulation of the thyro-adreno-sympathetic nervous system causes definite diseases such as exophthalmic goitre and gastric ulcer. Other investigators include essential hypertension.

Pain Must Be Checked

A headache once established may persist—the longer it lasts, the more harm it does. Prompt relief is necessary—danger of overstimulating the sympathetic nervous system should be avoided.

Acetanilid Checks Pain Rapidly

Acetanilid is our safest, most efficient and rapid-acting analgesic. It has been definitely proven, that it is *not* habit-forming and that it does *not* depress the heart when administered in therapeutic doses No cases of granulocytopenia have been traced to acetanilid.

A Frequently Prescribed Combination

Acetanilid $\frac{1}{2}$ gr. to the dose, in conjunction with $2\frac{1}{2}$ grs. phenacetin, combined with caffeine, plus sodium bromide and sodium citrate q.s., is the logical and most efficient anodyne. These ingredients are more active when prescribed in effervescent form, as in Bromo-Seltzer.

Send for samples and literature.



BROMO - SELTZER, LIMITED, TORONTO, CANADA



FOR BURNS

OINTMENT

Butesin Picrate Ointment contains 1% Butesin Picrate. Butesin is a powerful anæsthetic and analgesic, while picric acid is well known for its antiseptic and fixing properties. Applied to burns, ulcers, lacerations and other skin lesions, pain usually disappears in a short time; infection is prevented or checked; and healing is encouraged.

ABBOTT LABORATORIES, LIMITED, MONTREAL, CANADA

SUPPLEMENT

The Association

SIXTY-FIFTH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION, CALGARY, ALBERTA

June 18, 19, 20, 21, 22, 1934

THE Sixty-fifth Annual Meeting of the Canadian Medical Association was held in the Palliser Hotel, Calgary, Alberta, on June 18, 19, 20, 21, and 22, 1934.

The first session of Council was held on Monday morning, June 18th, commencing at ten o'clock. The Acting-chairman, Dr. Geo. S. Young, and the President-elect, Dr. J. S. McEachern, welcomed the members in attendance. Messages of greeting were received from the British Medical Association and from Dr. A. T. Bazin, of Montreal.

The following delegates, 68 in number, answered to the roll call:

Drs. Geo. S. Young (Acting-chairman), Toronto; J. D. Adamson, Winnipeg; G. A. B. Addy, Saint John; G. Harvey Agnew, Toronto; J. F. Argue, Ottawa; B. C. Armstrong, Medicine Hat; Sir Frederick G. Banting, Toronto; C. A. Baragar, Edmonton; V. E. Black, Moose Jaw; J. E. Bloomer, Moose Jaw; Wesley Bourne, Montreal; M. R. Bow, Edmonton; Col. J. T. Clarke, Ottawa; M. G. Cody, Calgary; L. C. Conn, Edmonton; P. C. Dagneau, Quebec; W. A. Dakin, Regina; L. C. Edmonds, Toronto; G. S. Fahrni, Winnipeg; J. G. FitzGerald, Toronto; A. G. Fleming, Montreal; Léon Gérin-Lajoie, Montreal; G. M. Gibson, Drumheller; J. C. Gillie, Fort William; Duncan Graham, Toronto; J. A. Gunn, Winnipeg; J. N. Gunn, Calgary; J. J. Heagerty, Ottawa; Heber Jamieson, Edmonton; G. R. Johnson, Calgary; A. S. Kirkland, Saint John; W. J. Knox, Kelowna; Geo. Lee, Shaunavon; David Low, Regina; W. S. Lyman, Ottawa; J. S. McEachern, Calgary; W. H. McGuffin, Calgary; K. G. McKenzie, Toronto; J. C. McMillan, Winnipeg; J. C. Meakins, Montreal; H. H. Milburn, Vancouver; Ross Millar, Ottawa; B. R. Mooney, Edmonton; S. Moore, Regina; Daniel Murray, Tatamagouche; A. G. Nicholls, Montreal; J. A. Nutter, Montreal; John Oille, Toronto; John Palmer, Calgary; F. S. Patch, Montreal; B. K. Paterson, Ottawa; E. L. Pope, Edmonton; R. W. Powell, Ottawa; A. Primrose, Toronto; F. W. Routley, Toronto; T. C. Routley, Toronto; E. P. Scarlett, Calgary; J. Stevenson, Quebec; G. F. Strong, Vancouver; P. H. T. Thorlakson, Winnipeg; Ethlyn Trapp, Vancouver; G. C. Van Wart, Fredericton; J. Verreault, Quebec; G. J. Wherrett, Ottawa; W. A. Wilson, Edmonton; Ward Woolner, Ayr; A. MacG. Young, Saskatoon.

Index to Supplement

	Page
Committee on Archives.....	1
Executive Committee.....	2
Department of Hospital Service.....	12
Public Health and Medical Publicity.....	13
Honorary-Treasurer	13
Central Program Committee.....	13
Editor	19
Ethics	20
Managing Editor.....	20
Pharmacy	20
Post-Graduate	21
Study Committee on Nursing.....	21
Cancer Study Committee.....	21
Inter-Provincial Relations.....	22
Maternal Welfare.....	22
Legislation Committee.....	23
Royal College of Surgeons of England.....	24
Meyers Memorial.....	24
Education	24
Group-Hospitalization	24
Economics (a Plan for Health Insurance in Canada)	25
Chairmen of Committees.....	62
Message from Prince of Wales.....	63
B.M.A. Meeting, Melbourne, 1935.....	63
Elections to Office.....	63

REPORT OF THE COMMITTEE ON ARCHIVES

In the absence of the chairman, Dr. C. F. Wylde, the Chairman called upon the General Secretary to present this report, the members of Council rising in tribute to their colleagues who had passed away since the last annual meeting of the Association:

Mr. Chairman and Members of Council —

Your Committee on Archives reports with regret, the loss of the following members by death during the past year:

Alexander, C. C., St. George, N.B.
Allin, Edgar William, Edmonton, Alta.
Bier, Thomas Henry, Brantford, Ont.
Black, William, Winnipeg, Man.
Boyd, Oliver, Medicine Hat, Alta.
Brien, Frederick Graham, Elphinstone, Man.
Brochu, Michel Delphis, Quebec, Que.
Buchanan, Daniel, Galt, Ont.
Byers, Herbert Percy, Melita, Man.
Calder, Margaret Cowan, Wingham, Ont.
Calkin, James O., Sackville, N.B.
Cameron, Irving Heward, Toronto, Ont.
Carmichael, Henry Barker, Montreal, Que.
Casselman, V. E. D., Vancouver, B.C.
Christilaw, John Albert, Winnipeg, Man.
Cleland, Frederick Adam, Toronto, Ont.
Day, Robert Grenville, West Saint John, N.B.
Dickson, William Howard, Toronto, Ont.
Downham, Walter Seymour, London, Ont.
Emery, Alban Frederick, Saint John, N.B.
Emmett, Harry Lloyd, Fonthill, Ont.
Foster, Charles Manley, Toronto, Ont.
Gardiner, Robert John, Kingston, Ont.
Gibson, Allan, Guelph, Ont.
Gillis, Edward G., Kensington, P.E.I.
Gundersen, Christian N., Calgary, Alta.
Hume, Gordon MacKenzie, Sherbrooke, Que.
Hutchison, Henry Seaton, Toronto, Ont.

Johnstone, Edmund James, Sydney, N.S.
 Keith, Harry W., Enderby, B.C.
 Kidd, John Franklin, Ottawa, Ont.
 Levesque, Ernest, Sudbury, Ont.
 Mackie, John Peat, Toronto, Ont.
 Munro, John Alexander, Amherst, N.S.
 Murphy, Colonel T. J. F., St. Johns, Que.
 McElroy, Arthur Stevenson, Ottawa, Ont.
 McGarry, Patrick Alphonso, Canso, N.S.
 Oliver, Charles Baird, Chatham, Ont.
 Pearson, Stella Messenger, Yarmouth, N.S.
 Reid, James William, Windsor, N.S.
 Roussseau, Arthur, Quebec, Que.
 Silcox, William Logan, Hamilton, Ont.
 Smith, Charles Barnes, Flin Flon, Man.
 Starr, Frederic Newton Gisborne, Toronto, Ont.
 Sykes, Andrew Victor, Winnipeg, Man.
 Teeter, Oscar, Amherstburg, Ont.
 White, Ernest Hamilton, Montreal, Que.
 Willson, Arthur Isaac, New Hamburg, Ont.
 Young, William Archibald, Toronto, Ont.

Your Committee has obtained during the past year a number of photographs, obituary notices, manuscripts of original articles published, and other material of interest; these have been filed with the Archives of the Association in the McGill Medical Library.

Considerable progress is reported by Dr. H. E. MacDermot in writing the history of the Association. He has obtained information from members, the early Minute books, and numerous Canadian journals. The first three chapters describing pre-confederation conditions in Medicine and steps leading up to the formation of the Association have been prepared, and also the description of a number of the earliest meetings.

It is probable that the history will be completed in a year's time.

All of which is respectfully submitted.

C. F. WYLDE,
 Chairman.

Approved.

REPORT OF THE EXECUTIVE COMMITTEE

It was agreed that this report should be discussed clause by clause.

Mr. Chairman and Members of Council:—

Your Executive Committee held its first meeting in Saint John, N.B., on Tuesday, June 20th, 1933. The first order of business was the selection of a Chairman. Dr. A. T. Bazin was the unanimous choice of the Committee for the position.

The following items of business are reported from that and subsequent meetings:

MEDICAL RELIEF

The following resolution was passed by Council and referred to the Executive Committee for action:—

"That the problem of medical relief which, in the present national emergency is most pressing, be made the subject of immediate consideration by the incoming Executive Committee which is authorized to co-opt the President of each Provincial Medical Association, to the end that early and suitable representations may be made to the Government of Canada upon the subject, the object being to obtain recognition of the principle that federal relief grants may be applied as necessary to the provision of medical care."

This matter received very careful consideration by the Executive Committee, when the following decision was arrived at:—

1. That the President, Dr. G. A. B. Addy; President-Elect, Dr. J. S. McEachern; Chairman of Council, Dr. A. T. Bazin; and the General Secretary be authorized to go to

Ottawa to make representations to the Prime Minister at the first opportunity after his return to Ottawa, reporting the decision of the Association at this annual meeting, with respect to medical relief.

2. That the expenses of this delegation to Ottawa be a charge upon the funds of the Association.

3. That, prior to going to Ottawa, a letter be sent to the Provincial Medical Associations, advising them of the resolution passed by Council; and that each Provincial Association be asked to supply the Executive Committee with an official communication indicating its support of this resolution, in order that this may be tabled with the Prime Minister, and also indicating that the resolution has the endorsement of the Provincial Government.

4. In the event that all of the provinces do not endorse this resolution as passed by Council, the delegation will go to Ottawa representing those provinces which have endorsed it.

5. Should any Provincial Association desire to augment the delegation by sending its President or other representative, the delegation will heartily welcome additional members.

Acting upon the foregoing instructions, the General Secretary communicated with the nine provincial medical associations and subsequently, with the consent and at the request of the respective Medical Associations, had the privilege of discussing the problem referred to with five of the nine provincial governments. On October 6th, a delegation composed of Dr. G. A. B. Addy, Dr. Léon Gérin-Lajoie, Dr. F. C. Neal, Dr. E. S. Moorhead, Dr. D. S. Johnstone and Dr. T. C. Routley, waited upon the Prime Minister and presented the following statement:—

The Right Honourable R. B. Bennett, K.C.,
 Prime Minister of Canada,
 Ottawa, Canada.

Dear Sir:

Acting upon instructions of the Canadian Medical Association, which body represents the organized medical profession of Canada, we appear before you today.

Most respectfully, Sir, do we desire to direct your attention to the following:—

1. The Government of Canada is recognizing and discharging an honourable and humane obligation in providing funds out of the national treasury, to the Provincial Governments of Canada, to extend relief to unemployed citizens and their dependents who are in need.

2. If we are properly informed, relief expenditures have been set out by your Government to include food, fuel, shelter and clothing; but do not include medical care.

3. On March 21st, we wrote you, urging that medical care be included in unemployment relief. (See Executive Report to Council, 1933, page 6.)

4. On March 24th, you replied stating in part that "The Federal Government makes contributions to enable the Provinces to fittingly discharge their obligations." (A copy of the letter is attached to this memorandum.)

5. The Provincial Governments of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario and Prince Edward Island have advised the Canadian Medical Association that, in their opinion, medical care is an obligation which should be included in unemployment relief.

6. The above mentioned Provincial Governments have further advised the Canadian Medical Association that, if permission were granted them by the Federal Government to include medical care in the list of relief provisions to which the Federal Government is contributing a portion of the cost, such care would be provided.

7. The medical profession always has given freely of its services to those unable to pay for such services. But there comes a limit, beyond which any citizen, doctor or layman finds himself powerless to proceed in giving of his time or money.

8. At the present time, the medical profession, in some parts of Canada, have reached the point where they cannot further supply medical care gratuitously to

persons on relief. The profession, however, adhering to its ideals and traditions, and having in mind that its first duty is the protection of the public health, will gladly undertake to contribute, by way of service, one-half of the cost of such care during the present emergency; and would respectfully suggest that the other half of the cost of their professional services be assumed by the State.

May we summarize—

1. The Federal Government is providing relief funds to the provinces.

2. Such relief funds are intended to assist each province to fittingly discharge its obligations.

3. The provinces have stated that medical care is an obligation and that the Doctors should not be asked to contribute their services gratuitously, thus carrying the entire cost.

4. The Doctors are willing to contribute one-half the cost during the present emergency by accepting as their fee one-half the established tariff rate for their Province.

5. The Provinces are willing to pay one-half the cost of medical care if the Federal Government will permit national funds to be used for the purpose on the same basis as such national funds are being used to pay for food, fuel, shelter, and clothing.

6. Most respectfully, Sir, do we ask that your Government approve the addition of medical care to relief provisions and that the Provinces be so advised at the earliest possible date.

All of which is most respectfully submitted on behalf of the Association by

G. A. B. ADDY
E. S. MOORHEAD
D. S. JOHNSTONE
F. C. NEAL
L. GÉRIN-LAJOIE
T. C. ROUTLEY.

Presented to Premier Bennett, Friday, Oct. 6/33.

OFFICE OF THE PRIME MINISTER
CANADA

C
O
P
Y

Ottawa,
24th March, 1933.

Dr. T. C. Routley,
General Secretary,
Canadian Medical Association,
184 College Street,
Toronto 2, Canada.

Dear Sir,—

I have your letter of the 21st, with respect to medical attention being provided for the needy during the period of depression.

I am bringing your communication to the attention of the Minister of Labour.

As you are, of course, aware, the actual administration is carried on by the Provincial authorities, and the Federal Government makes contributions to enable the Provinces to fittingly discharge their obligations.

You will be further advised in due course.

Yours faithfully,
(Sgd.) R. B. BENNETT.

Herewith is the report of your delegation upon the conference. Mr. Bennett said:—

1. While I have every sympathy with the point of view you have expressed, you really have no contact with me; the matters you have presented are strictly the business of the provinces.

2. I am fully aware of the necessity of proper medical care being provided all people on relief but must insist that this is an obligation resting upon each Provincial Government.

3. I am in entire accord with the argument that the medical profession should not be asked to carry the load of providing the necessary medical relief.

4. I shall advise each province that it should undertake to provide medical care, to pay the cost of same and in the event of the province doing this and submitting its cost figures to the Federal Government, sympathetic consideration will be given by the Federal Government to sharing the cost of such medical care according to the merits of the case presented by the province.

Our Comments.—

In the opinion of some members of the delegation, Mr. Bennett implied that the Federal Government would pay part of the cost of medical care where it was shown by a Province that it couldn't afford to pay the whole cost.

Seeing that various provinces have different needs, he would not tie himself to assist by any percentage or proportion on of the funds expended.

5. The Prime Minister advised the Committee that the position of the Federal Government in the matter would be made very clear to each Provincial Government and further that the Canadian Medical Association would be advised as to what was being said to the provinces.

6. It was pointed out to the Prime Minister that the delegation was under the impression, after conversations with some of the Provincial Governments, that the Federal Government had prohibited the utilization of Federal funds for medical care. The Prime Minister stated that the Federal Government had at no time forbidden the provinces to expend money for medical care but that the Federal Government had set out specifically that they were supplying funds and had stated that these funds could be utilized in providing food, fuel, shelter and clothing. On the foregoing items, the Federal Government has committed itself to a definite proportion of the total cost but the Federal Government is not prepared to commit itself to any proportion of the cost of medical care as a blanket policy covering the provinces as a whole. It should be repeated, however, that the Federal Government has no desire to see any province disregard its responsibility in respect to medical care but, on the contrary, looks to each province to provide such care and if the province needs financial aid in respect to medical care, the Federal Government will not expect any province to carry the burden in this respect beyond reasonable limitations.

7. The interview lasted one hour. It was the consensus of opinion of the delegation that the Prime Minister of Canada shared completely our point of view with respect to the care of the people and the necessity of the doctor being paid, at least in part, for the services which he must render but it is up to each province, through its constituted authorities, to discharge this obligation, both to the people and to the doctors and when this is done, to look to the Federal Government for such assistance as can be proven is needed by the area concerned.

Under date of December 12th, the Honourable Prime Minister forwarded two letters, copies of which follow,—

OFFICE OF THE PRIME MINISTER
CANADA

Ottawa
12th December, 1933

Dr. T. C. Routley,
General Secretary,
Canadian Medical Association,
184 College Street,
Toronto 2, Canada.

Dear Sir,—

I enclose you herewith a copy of a letter which I have sent to the Prime Ministers of the Provinces.

I regret the long delay. It was occasioned by the necessity of clearing up a possible misunderstanding with one of the Provinces.

Yours faithfully,
(Sgd.) R. B. BENNETT.

OFFICE OF THE PRIME MINISTER
CANADA

C
O
P
Y

Ottawa, December 12th, 1933.

Dear Premier Henry,—

A delegation representing the Canadian Medical Association met me some weeks ago and urged the desirability of the Federal Government providing a portion of the cost of medical aid for those receiving relief in the various Provinces.

It was pointed out to me that many of the Provinces had expressed their willingness to provide for medical services for those on relief, but they alleged that the Dominion Government prevented them from doing so.

It is rather difficult to understand such a statement being made. The responsibility of the Provinces in caring for the sick, by methods which they have themselves determined, cannot be made a Federal obligation. We have contributed to relief, but we have not set up a Federal Relief Commission as some of the Provinces are not willing to surrender their constitutional rights in that regard.

I pointed out to the delegation that I assumed the Provinces would continue to discharge their obligations to their citizens, but if, from time to time, representations were made in respect to individual communities where it was found that the burden was unduly onerous, the Federal Government would sympathetically consider each case upon its merits and determine whether or not, on the facts stated, it would be warranted in making a contribution to assist the Provinces to discharge their normal responsibilities regarding medical and hospital care and treatment.

I intimated to the delegation that I would communicate with each of the Provinces in the sense above indicated.

Yours faithfully,
(Sgd.) R. B. Bennett.

Copies of these communications have been sent to all the provincial associations.

Your Executive Committee expresses the opinion that it has done everything within its power to support the claims of the medical profession to adequate recognition and compensation in regard to payment for services rendered to unemployed persons and their dependents.

Approved.

The Chairman asked for comments on medical relief from representatives of the different provinces of Canada. The following points were brought out.

Quebec.—On January 2nd last, a delegation of three men from a committee named by the Province of Quebec Medical Association was received by the Prime Minister and discussed the question of medical relief with him. He did not see his way clear to do anything. Following this conference, the Committee went to the Welfare Department of the City of Montreal. They did not think it possible to expend money on medical relief. The Prime Minister of the Province took the same stand as the Prime Minister of Canada, namely, that he considered it unjust that the doctors should be forced to carry the whole burden, and suggested that the municipalities should assist.

Manitoba.—The Committee on Relief, under

the chairmanship of Dr. E. S. Moorhead, of Winnipeg, met Premier Bracken and discussed this problem with him, but got no satisfaction. He stated that if the municipalities could not find the money he would see that they received help. On February 22nd, a new plan was put into effect by which the Relief Commission of the City of Winnipeg agreed to pay doctors' accounts at about 50 per cent of the regular tariff, with a monthly limit for each doctor amounting to \$100. For the first three months of operation under this plan, medical relief has cost the City of Winnipeg \$6,800 a month.

Ontario.—In the Province of Ontario most of the larger centres are working under the Order-in-Council, whereby the Provincial Government agrees to pay two-thirds of the cost of medical relief, provided the municipality will pay one-third. The doctor accepts 50 per cent of the regular tariff in payment of his accounts, and each doctor (except in the northern districts) is limited to \$100 a month. In the northern districts this limit has been increased, to meet the needs of certain localities. The tariff adopted is that approved by the Ontario Medical Association. This plan appears to work out very satisfactorily where it has been adopted.

British Columbia.—Outside of the City of Vancouver, there has been no provision for medical relief. In 1933 an agreement was made with the city authorities by which a definite sum (\$3,000 per month) was set aside to cover house and office visits of doctors for those on relief. The money is divided *pro rata*, as far as it will go. The osteopaths also tried to have their accounts included in this relief money but were refused.

Saskatchewan.—The Provincial Government has allowed a grant up to \$50 a month for each doctor. We do not know how much each got out of this. The Government of Saskatchewan cannot afford to be generous. Rural municipalities, under the Act, are supposed to take care of indigent cases. It is difficult to prove who is an indigent, but about one-half of the rural municipalities attempt to deal fairly with the doctor. In the cities, we have different arrangements, entirely under the local councils. In no case do the doctors get more than 50 per cent of the regular tariff. So many of our doctors cannot collect from their private patients, and so many municipalities cannot afford to pay, that we feel there should be some pro-

vision from Ottawa. Our Government has stated frankly that medical services should be included in relief expenditures, and that federal money should be released for this work.

New Brunswick.—The Prime Minister of Canada holds the view that the burden of medical relief belongs to the municipalities. Our Province refuses to make a statement that they are not able to carry the load, throwing it back on the municipalities. Some urban centres have made their own arrangements. Our problem is not so serious as in the Western Provinces.

Nova Scotia.—No action has been taken on this matter in Nova Scotia, nor has the matter been discussed particularly by our Medical Society. The proportion of indigents in Nova Scotia is very small.

Alberta.—Our laws throw the responsibility for relief on the municipalities. In many instances they are trying to do their very best. The one phase of the question which is important is the effect it is having upon medical men by driving them to make unfair contracts with municipalities. We have made all sorts of representations to the provincial government for help, but with no satisfactory result as yet.

The General Secretary reported that last autumn the Prime Ministers of the four Western Provinces were interviewed, and, in each case, it was intimated that if the Government of Canada would undertake their obligation of one-third of the cost of relief, they (the Provinces) would undertake one-third, passing the other one-third to the municipalities. We suggested to the Provinces that they might assume two-thirds and hope the federal government would undertake the balance. Unless we can persuade the Provincial Governments to start by providing something it does not seem possible to get any action at Ottawa. The Rt. Hon. Mr. Bennett says that if the provinces show that they cannot carry the load the Federal Government will not see them stuck.

The question was asked as to whether it would be worth while to make any further representations to the Government at Ottawa. In reply, it was pointed out that Mr. Bennett has definitely stated that he regards this matter as a provincial responsibility, and also that no federal law can force the Provincial Governments to do their duty. Anything further must be done through the Provincial Governments and the municipalities.

PUBLICITY FOR THE SECTION OF MILITARY MEDICINE

The Section of Military Medicine expressed the opinion to Council that publicity with regard to the aims and objects of the Section should be given in the *Journal*. Your Committee accepted this suggestion sympathetically and referred it to the Editor of the *Journal*.

Approved.

FREE BLOOD TRANSFUSION SERVICE IN CANADA

The St. John Ambulance Association, through its Director, Colonel J. T. Clarke, expressed a desire to co-operate with the Canadian Medical Association in providing free blood donors in those areas in Canada in which the St. John Ambulance Association is organized. Your Committee expressed its appreciation of what appeared to be a splendid suggestion and instructed the General Secretary to communicate with the various hospitals and the provincial medical associations with regard to the development of the plan. At this time, we report progress.

Approved.

STUDY COMMITTEE ON CANCER

The following recommendations contained in the report of the Study Committee on Cancer were passed by Council to the Executive Committee for study and such action as they should consider advisable,—

1. To arrange for a section in the *Journal*, in which each month some questions relating to diagnosis and treatment of cancer will be dealt with.
2. To prepare from time to time leaflets or booklets dealing with early manifestations of cancer in various parts of the body, for distribution to all Canadian doctors.
3. To prepare and distribute, when the time is opportune, literature for the enlightenment of the laity on this subject.
4. To arrange for special meetings at regular intervals in all local and district medical societies throughout Canada at which speakers secured locally and from adjacent medical teaching centres will give addresses on some aspect of the cancer problem.
5. To arrange through the Provincial Medical Associations for speakers to address public meetings on this problem.
6. To use its influence with the provincial associations to appoint a Provincial Cancer Committee in all provinces, where this step has not already been taken.
7. To co-operate with the Provincial Cancer Committees in organizing a local committee in each organized hospital of 100 beds and upwards. This local committee will study all records of cancer cases admitted to the hospital and take the responsibility to see that they are as complete as possible. It will undertake to make a tabulated synopsis of each cancer record on a form provided by the Department of the Canadian Medical Association. These forms will be kept available in a loose-leaf binder in the hospital. The Committee will provide a speaker at each monthly staff meeting, who will give a brief address on the early signs of cancer in some site, using the hospital records to give point to his communications.

Subsequently the Executive Committee decided that immediate steps should be taken to initiate the formation of a national society for the combatting of cancer in Canada, which organization shall co-ordinate all the various cancer organizations now in Canada; and that a study committee be appointed to report as to the nature and character of such an organization and ways and means which should be adopted to effect it. A committee was later appointed under the chairmanship of Dr. A. Primrose of Toronto and is now at work.

Approved.

PUERPERAL SEPTICÆMIA

The Committee on Maternal Welfare in reporting to Council called attention to the fact that a large proportion of maternal deaths is due to puerperal septicæmia, a reportable disease, and that a great many of such cases are not being reported. The General Secretary was instructed to refer this matter to the provincial medical associations, to be referred through them to the local medical societies, with the recommendation that steps be taken to have all cases of puerperal septicæmia reported; also that an editorial on the subject be published in the *Journal*. The necessary action has been taken.

A communication was received from the Dominion Council of Health, asking that the Committee on Maternal Welfare of the Canadian Medical Association prepare a brief statement as to the cause, prevention, and treatment of puerperal septicæmia, this statement to be presented to the next meeting of the Dominion Council of Health. This statement is being prepared by our Committee on Maternal Welfare and will be presented as requested.

Approved.

NATIONAL RESEARCH COUNCIL

The National Research Council has advised us of the establishment of an Associate Research Committee on the Medical Application of X-rays and Radium, and has asked the Canadian Medical Association for their active interest, co-operation, and support. The matter was referred to the Section of Radiology. Subsequently, on the invitation of the National Research Council, it was agreed that the Chairman of Council of the Canadian Medical Association should be appointed to represent the Association on the National Research Council's Committee.

Approved.

DEPARTMENT OF NATIONAL HEALTH *re* HEROIN

The following resolution was brought to the attention of the Executive Committee by the Committee on New Business at the annual meeting in Saint John, with reference to a communication from the Department of Pensions and National Health stating that, at the International Narcotic Convention in Geneva it was recommended that the use of heroin should be abolished or greatly restricted,—

"The correspondence submitted indicated that two proposals were entertained at Geneva, namely, to prohibit the manufacture of heroin or to limit its exportation to non-manufacturing countries, and then only under government supervision. Taking into consideration the extremely limited therapeutic use of this drug and its dangers, your committee is unanimously in favour of abolishing its entry into, or manufacture in, Canada."

At the meeting of Council, it was agreed that this resolution should be forwarded to the Department of Pensions and National Health with the approval of the Association.

It was the opinion of the Executive Committee that the General Secretary should advise each of the Provincial Medical Associations of the action taken by Council in connection with this matter.

Action was taken as instructed.

Approved.

SALARIES OF DOCTORS IN UNEMPLOYMENT CAMPS

At the annual meeting in Saint John, the Committee on New Business made the following recommendations to Council with reference to medical arrangements for unemployment camps,—

1. It is deplored that this arrangement has been promulgated as a relief measure for medical men, when in practice it is apparently not a relief measure and cannot be recognized as such.

2. At all unemployment camps, part time men should be employed where at all feasible, full time men to be employed only where part time arrangements are not practicable.
3. The inadequacy of the proposed scale of remuneration to full time qualified medical practitioners is deplored, and it is urged that the salary paid to medical officers be adequate and at least the equivalent to that paid for similar responsibilities in the Army.

Council adopted the report of the Committee on New Business and the Executive Committee instructed the General Secretary to continue negotiations with the Director General of Medical Services along the line suggested. Subsequently, the negotiations were carried out with the following recommendations as to the medical administration of unemployment camps,—

Labourers—

1. Medical examination before being enrolled.—
 - (a) Class A—Physically fit for hard manual labour.
 - (b) Class B—Physically fit for light continuous duty—Cookhouse duties, sanitary duties, watchman duties, etc.

All men must be passed free from communicable diseases of all kinds, with reservations as to skin affections, etc., which could be readily cared for in camp.
2. Responsibility of Federal Government to those becoming disabled from sickness or injury while on the strength.
 - (a) Maintenance in hospital or convalescent hospital until again fit.
 - (b) In case of injury—hospital care as above and also compensation for permanent disability as per schedule of province in which injury occurred.
 - (c) Venereal disease contracted after enrolment. Final decision as follows: "Should be treated and penalized, the penalty to rest with camp authorities. Prophylactic centres to be established."
3. Vaccination against Smallpox and Typhoid group compulsory after joining camp.

*Medical Personnel—**Full Time—*

Before examination as to physical condition during service, either injury or disease—full hospitalization and expenses during treatment and on full pay. If declared unfit for further camp duties, after a reasonable period of convalescence, to be struck off the strength—with or without pension, according to whether disability is result of camp service or no.

Senior Full Time—

A graduate with two or more years of practical experience, either in hospital or practice. Remuneration—\$100.00 per month with board, lodging and service clothing. (The question of raising the pay of the present men employed on full time duty at \$70.00 a month was left to the Medical Administration, for special consideration in the case of individual doctors.)

Junior Full Time—

A graduate with not more than one year's practical experience either in a hospital or practice. Remuneration—\$50.00 to \$60.00 per month, with board, lodging and service clothing. The full time man shall not furnish anything in the way of drugs, dressing and equipment.

Part Time Men—

Where a camp is situated within striking distance of the office of a practising physician, the latter should be employed, rather than a full time man.

Part time men should visit camp at least three times a week and at a stated hour to hold sick parade and to inspect and advise on sanitation. They should also be available for call on emergency. Remuneration—On the basis of \$1.00 per month per man for camps up to 500. In camps over 500, the part time man shall receive no additional remuneration but shall be provided with the assistance of a junior full time man at \$50.00 or \$60.00 per month up to 1,000. For each additional 1,000 another hospital detention hut and junior assistant full time medical officer should be provided.

Mileage—

When the camp is more than ten miles by road, from the office of the part time appointee, he should be reimbursed mileage at the rate of 50c per mile one way, for the distance to camp over and above the initial ten mile basis.

Full time men should be employed in camps where no part time man is available within twenty-five miles.

Supplies—

Part time men shall not provide drugs, dressings or equipment.

First Aid—

Each camp shall be provided with a medical detention hut of a size, and with a number of beds adequate to the size of the camp and the distance to the nearest civil hospital. This hut shall be equipped with drugs, dressings, splints, instruments, etc., sufficient for the care and treatment of the sick and injured. Nursing orderly personnel shall be employed and shall be constantly on duty or on call for first aid. Complete records shall be kept of all patients treated.

Hospitalization—

Patients who cannot be properly treated in camp shall be, on recommendation of the camp doctor, transferred to a nearby civil hospital under such arrangements as may be made by the Department with the individual hospital. The camp doctor, as such, shall cease to have further responsibility for treatment, but may, and should, visit his patients periodically when within reasonable distance.

Approved.

GROUP HOSPITALIZATION

In many parts of the United States, schemes have been promulgated whereby hospitals, at a fixed fee, are selling hospital insurance and, in many instances, including medical services. Your Committee felt that this is a movement which demanded study at this time. Accordingly, a subcommittee has been appointed to work in close conjunction with our Department of Hospital Service to deal with the matter.

Approved.

NOTICE OF MOTION *re* BY-LAWS *Re* SECTIONAL OFFICERS

The Committee recommends that Chapter 4, Section 2, of the By-Laws of the Association be amended to read as follows:—

"Where any section fails, for any cause, to appoint sectional officers for any year, it shall be in order for the Executive Committee to nominate officers for that section for that year."

Re ANNUAL MEETINGS

The Executive Committee gives notice of motion that the By-Laws of the Association be amended so as to permit of the naming of the places of annual meeting at least two years in advance.

In connection with these two sections of the report, the General Secretary presented a recommendation from the Executive Committee, that

the incoming Executive Committee be instructed to make a complete revision of the By-Laws, bringing them up to date with the organization as it now exists. This recommendation received the approval of Council.

ROYAL SOCIETY OF CANADA

The Royal Society of Canada has invited the Canadian Medical Association to become affiliated with it. The Executive Committee approves and recommends accordingly to Council.

Approved.

TRACHOMA AMONG THE INDIANS OF CANADA

It was reported to your Executive Committee that there were more than 7,000 cases of trachoma among the Indians of Western Canada and that something should be done about it. The General Secretary was instructed to take the matter up with the Department of Indian Affairs at Ottawa. This was done. The Deputy Superintendent General, Dr. H. W. McGill, stated that the report was grossly exaggerated, that the Department was fully cognizant of the situation, and that everything possible was being done for the Indians in matters concerning health.

Approved.

GASOLINE TAX ABATEMENT

The General Secretary was instructed to communicate with the provincial medical associations, advising them that a suggestion had been made that the provincial government might be requested to refund to members of the medical profession, the gasoline tax paid by them as at least an official acknowledgment of the tremendous amount of charity work done by the medical profession. Of the provinces heard from, 3 were in agreement, 2 felt that no useful purpose would be served and that if any provincial government did accede to this request, it might be construed by them as fully discharging their obligations to the medical profession; and, therefore, that the move was ill advised.

Approved.

INCOME TAX

The General Secretary reported that the Commissioner of Income Tax for Canada had called attention to the fact that the Inspector at one of the Canadian branches had pointed out that, in his judgment, the doctors were being allowed too high an abatement in respect to the operation of motor cars. The General Secretary discussed the matter with the Inspector who had thus reported, and later got into communication with the Commissioner. No further action has been taken by the Commissioner in this connection. It was pointed out by the Commissioner that, in his judgment, the memorandum issued jointly by himself and the Canadian Medical Association last year is working out satisfactorily.

Approved.

In discussing this section of the report, it was pointed out that any doctor in Canada who finds it necessary to pay one dollar of income tax to the federal government is saved at least \$15.00 by means of the abatements which have been secured by the Canadian Medical Association.

RESOLUTION FROM THE MANITOBA MEDICAL ASSOCIATION *re* MEDICAL COUNCIL OF CANADA

The following resolution was referred to this Executive Committee by the Manitoba Medical Association:—

"WHEREAS it is possible in nearly every profession to take extra-mural work leading to University degrees by units or subjects,

AND WHEREAS the possibility of writing off degrees by units would lead to systematic study, thereby improving the service rendered to the public, AND WHEREAS, for a general practitioner, it is practically impossible to prepare from six to eight subjects in addition to his ordinary work.

AND WHEREAS the graduates in the War years from 1915 to 1920 did not have an opportunity of writing off their L.M.C.C. examinations, many of them going Overseas immediately on graduation, THEREFORE, BE IT RESOLVED THAT we, the North-Western District Medical Society, in conference assembled at Virden, Manitoba, request the Manitoba Medical Association to take up with the Medical Council of Canada the question of the advisability of allowing graduates (of recognized universities in Canada of the years 1913 to 1920, inclusive), to write off the L.M.C.C. examinations by subjects."

Your Executive Committee expresses the opinion that the matter referred to in the resolution is one which should engage the attention of the Colleges of Physicians and Surgeons of the provinces in cooperation with the Medical Council of Canada, and so recommends to Council.

Approved.

RADIO BROADCASTING

From time to time, conferences have been held between Mr. Hector Charlesworth, Chairman of the Radio Broadcasting Commission, and your Secretariat with regard to the broadcasting of information relating to health. The Chairman of the Commission expresses a keen desire to cooperate with the Canadian Medical Association and evidence was adduced to your representatives that the Commission and the Division of Health of the Department of Pensions and National Health are performing a splendid piece of work in censoring a great deal of the material presented to them for broadcasting purposes. The question of broadcasting health talks and also advertising *re* patent medicines were reviewed by Dr. Fleming and the General Secretary and they were assured that every effort is being put forth to protect the public.

Approved.

In discussing this section of the report, it was pointed out that the Radio Broadcasting Commission some time ago passed regulations by which all broadcasts are to be reviewed by it before being put on the air. So far, they have not succeeded in having all stations comply with this regulation. The Commission, of course, has no control over broadcasts from the United States. Great stress was placed upon the importance of careful supervision of radio advertising in the matter of patent medicines, and this matter was passed to the Department of Publicity and Health Education for attention.

DUTY ON REPRINTS

From time to time, your Committee receives complaints from doctors who are charged duty on reprints of articles published by them in foreign journals. This matter has been reviewed with the authorities at Ottawa with the request that this duty be dropped. So far no success has attended our efforts but we shall continue to urge that our recommendations be adopted.

Approved.

MEMBERSHIP

The following comparative statement of membership in the Association is presented:—

	<i>Paid Membership 1932</i>	<i>Paid Membership 1933</i>
British Columbia.....	350	328
Alberta.....	252	249
Saskatchewan.....	255	238
Manitoba.....	264	224
Ontario.....	1,471	1,216
Quebec.....	520	383
New Brunswick.....	115	125
Nova Scotia.....	151	155
Prince Edward Island..	31	32
Newfoundland.....	6	5
United States.....	315	288
Miscellaneous.....	62	60
Yukon.....	3	3
	<hr/> 3,795	<hr/> 3,306

It will be observed that we sustained a loss last year of 489 members. Considering that the country is in the fourth year of what is said to be the worst economic depression from which the world has yet suffered your Committee considers that our membership record is fairly satisfactory.

Approved.

It was noted with interest that in only three provinces was there an increase in membership in 1933, namely, New Brunswick, Nova Scotia, and Prince Edward Island, and these are the three provinces in which (according to reports received) the relief problem is not very serious. Apparently the East is not feeling the depression to the same extent as Western Canada.

PROPRIETARY AND PATENT MEDICINES ACT

The Canadian Pharmaceutical Association, with the cooperation of the Committee on Pharmacy of the Canadian Medical Association, has been endeavouring to secure the following amendments to the Proprietary or Patent Medicines Act:—

1. That sub-section 4 of Section 4 be repealed and the following substituted therefor:

"The manufacture of all Proprietary or Patent Medicines for the internal use of man, containing any drug included in the Schedule to this Act shall be under the continuous supervision of a pharmaceutical chemist registered or licensed under the laws of one of the several provinces of Canada and every person violating or failing to observe the provisions of this sub-section shall be guilty of an offence and liable to a penalty not exceeding one hundred dollars and costs, or to imprisonment for any term not exceeding two months for a first offence, and for a second offence shall be liable to the said fine or imprisonment and in addition shall have his certificate of registration and license under this Act cancelled."

2. That sub-section 4 of Section 6 be amended by adding thereto the following:—

"but no person, firm or corporation other than a Pharmaceutical Chemist or Licentiate of Pharmacy registered or licensed under the laws of the Province in which the business thereof is carried on shall sell, offer or keep for sale by retail, any medicine registered under this Act containing any of the drugs mentioned in the Schedule hereto, and every person violating the provisions of this sub-section shall be guilty of an offence and liable to a penalty of not less than \$10.00 and not exceeding \$100.00

and costs or to imprisonment for any term not exceeding three months."

3. That sub-section (c) of Section 8 be amended as follows:—

"If it contains any drug which is included in the Schedule to this Act the name of which, and the amount per dose of which *together with the word 'poison'* are not conspicuously printed on an inseparable part of the label and wrapper of the bottle, box or other container, or if the quantity of such drug exceeds the amount permitted by the Advisory Board."

It was reported to us by our Committee that the principle of this suggestion was accepted by the Department at Ottawa.

4. Amendment to Section 11, which would add to sub-section 1 thereof the following:—

"and no person, firm or corporation shall sell or offer for sale or cause to be sold or offered for sale from door to door or upon a public place or highway, any proprietary or patent medicine."

It was reported to us by our Committee that the principle of this suggestion was accepted by the Department at Ottawa.

The following resolution was passed by your Executive Committee:—

"That this report be received and that the matter be referred to the Committee on Legislation of the Canadian Medical Association, the Committee on Pharmacy of the Canadian Medical Association, and the Canadian Pharmaceutical Association, asking them to bring in a recommendation to the annual meeting to the effect that this Association go on record as in favour of prohibiting the sale of such drugs as are referred to, without a doctor's prescription."

It was pointed out that it is the intention of the Department of Pensions and National Health at Ottawa to revise the list of drugs which may not be sold without a doctor's prescription. It was also pointed out that it is necessary to have direct evidence in cases of patent medicines being sold to cure specific diseases before prosecution can be made. A police report will not suffice.

POST-GRADUATE SPEAKERS

The General Secretary reported that the Prince Edward Island Medical Society and the New Brunswick Medical Society had expressed a desire to have a team of speakers attend their annual meetings, the New Brunswick meeting to be held in Woodstock on July 10th and 11th, and the Prince Edward Island meeting scheduled to take place in Summerside on July 13th.

It was agreed that a team of speakers should be sent to the East this coming summer. It was also agreed that, as a matter of policy, the Association should send speakers to the Western Provinces when the annual meeting is held in the East and to the Eastern provinces when the annual meeting is held in the West. It is hoped, in this way, to keep the post graduate department alive in anticipation of the resumption of the plan on a very much larger scale when economic conditions have improved.

Approved.

PROVINCIAL MEDICAL ASSOCIATIONS AND COLLEGES OF PHYSICIANS AND SURGEONS

Where a provincial medical association turns all its business affairs over to the College of Physicians and Surgeons of the province, it would be in order for the provincial medical association, by resolution, to inform the Canadian Medical Association that the College of

Physicians and Surgeons has authority to speak for the provincial medical association. It is recommended to Council that each province concerned be asked for this authority.

Approved.

SPECIALISTS

There is a growing concern and interest in the country with regard to what constitutes a specialist and who should be allowed to call themselves specialists. This matter is brought to the attention of Council for such consideration as it merits.

Approved.

Council instructed the incoming Executive Committee to make a study of the whole problem of specialization, and bring in a report embodying their recommendations. At the first meeting of the Executive Committee a committee, composed of Drs. E. S. Ryerson, Duncan Graham, J. G. FitzGerald, and A. Primrose, was appointed to study this question and report to the next meeting of the Executive Committee.

QUEBEC MEDICAL ASSOCIATION *re* A.P.I.M.

For a number of years, the Canadian Medical Association was in affiliation with the Association Professionnelle Internationale des Medecins. Last year Council abrogated the affiliation on the ground of economy, in as much as it could not be ascertained that the results obtained justified the expenditure involved. The Head Office of the A.P.I.M. is in Paris and all its deliberations are conducted in the French language. The Province of Quebec Medical Association has asked if it would be permissible for them to become affiliated as a branch, with the A.P.I.M. Your Executive Committee approved.

Approved.

SECRETARY OF STATE *re* INCORPORATION

A letter was received from Dr. J. J. Heagerty, Chief Executive of the Department of Pensions and National Health asking for an expression of opinion with regard to an application which had been received requesting the incorporation of a company to be known as "The Medical Service Bureau of Canada, Limited" or "The Health Service Bureau of Canada, Limited". The purpose of this incorporation would be to do business throughout Canada and elsewhere, rendering medical health, and related aid to those seeking such aid through the services of qualified doctors, dentists, nurses, and other professional and non-professional persons duly qualified therefor, and to provide hospital, ambulance, and other related services to such persons, and to trade generally in medical, pharmaceutical, and other supplies pertaining to the foregoing, the company to be a joint stock company.

The General Secretary reported that, in his reply to Dr. Heagerty, he had called attention to the fact that, in the Provinces of Canada, only licentiates of the respective Colleges of Physicians and Surgeons may practise medicine, and each province is autonomous in matters of this kind. For this reason, it would seem to be outside the jurisdiction of the federal authorities to grant a national charter for the purpose indicated in the application. He also called attention to the fact that there is no need in Canada for the intervention of a private company in the practice of medicine, a company which is obviously organized for profit.

Your Executive Committee concurs.

Approved.

CHANGES IN THE DEPARTMENT OF PENSIONS AND NATIONAL HEALTH

The recent action of the Dominion Government in discontinuing the operation of the Division of Child Welfare of the Department of Pensions and National Health has engaged the serious attention of your Executive. A special committee was appointed to secure all possible information in regard to this matter, for presentation to Council.

Approved.

In connection with this section of the report, the General Secretary presented the following memorandum which had been prepared by Drs. J. G. FitzGerald and A. Grant Fleming at the request of the Executive Committee.

MEMORANDUM FOR COUNCIL CONCERNING DISCONTINUANCE OF THE CHILD WELFARE DIVISION OF THE DEPARTMENT OF PENSIONS AND NATIONAL HEALTH

The Canadian Medical Association having, from its inception, urged upon the Dominion Government the desirability of establishing a Department of National Health is naturally and logically interested in any action affecting that Department.

The original Act of 1919 creating the Department, set out as a specific duty "cooperation with the provincial, territorial and other health authorities with a view to the co-ordination of the efforts proposed or made for . . . the conservation of child life, and the promotion of child welfare."

A Child Welfare Division was created in the Department in 1919. The Canadian Council on Child and Family Welfare was organized in 1922 through the initiative of the Department, presumably to supplement the work of the Department in the manner and within the limits to which a voluntary agency can supplement the work of an official department.

The inclusion in the new Department of Pensions and National Health Act of 1928 of the identical clause referring to child hygiene as it appeared in the Act of 1919 indicates that the Department at the latter date continued to hold to the same principle.

The discontinuance of the Division of Child Hygiene and the transference of the work of the Division of the Canadian Council on Child and Family Welfare is explained by the Honourable the Minister of Pensions and National Health in his memorandum to the Treasury Board, and in a statement published in the newspapers during December, 1933.

It is noted that the Honourable the Minister claims:

- (1) "To some extent, the work of the Department is a duplication of that carried on by the Provincial Health Departments and particularly the Canadian Council on Child and Family Welfare."

The duty of the Minister, as set out in the Act, is cooperation and coordination. Duplication can be eliminated without complete discontinuance. As the Canadian Council came into the field later than did the Division, it appears that if there were duplication then the Canadian Council was responsible for this.

- (2) "It is considered that the Canadian Council on Child and Family Welfare could acceptably perform the work now being carried on by the Child Welfare Division of the Department with satisfaction to the health agencies of Canada and to the public at large."

This statement is open to question, because, as far as we know, health agencies were not consulted. The Canadian Medical Association was not asked for an opinion. The only opinions expressed so far, of which we have any knowledge, have been opposed to the action taken.

- (3) "The Executive Director of the Canadian Council on Child and Family Welfare is Miss Charlotte Whitton, M.A. The Secretary of the Division on Maternal and Child Hygiene is Miss Agnes Baird, R.N. (since resigned)

while Madame Noel Chassé, R.N., is in charge of the French-speaking services. Dr. J. T. Phair, Director of Child Hygiene of the Ontario Department of Health, is Chairman." (Since resigned).

"The Canadian Council on Child and Family Welfare has notified the Department of the appointment of Dr. L. P. MacHaffie, as consultant in paediatrics, and of Dr. John Puddicombe, as consultant in obstetrics. Dr. J. J. Heagerty, D.P.H., Chief Executive Assistant, Department of Pensions and National Health, is the departmental representative."

It is to be noted that the Dominion Government has transferred its responsibility for "the conservation of child life and the promotion of child welfare", which obviously includes maternal welfare, from a Department under medical administration, from a Division of that Department under immediate medical direction, to an organization under a non-medical director. The Canadian Medical Association should seriously consider if the appointment of two consultants is sufficient medical direction for what are essentially medical problems.

The Canadian Medical Association has recognized the place and value of voluntary health organizations, and has supported these organizations. At the same time, the Canadian Medical Association has consistently supported the development of public health departments to assume responsibilities in the field of public health.

The generally-accepted policy of relation between official and non-official health agencies is that the non-official agencies shall transfer proved pieces of public health work to the official agencies as rapidly as the latter can absorb them. The reversal of this procedure by the Department of Pensions and National Health, on the grounds given, is open to question. To carry such action to its logical conclusion would mean that municipal, county and provincial departments of health would be turning over much of their work to voluntary health organizations, mostly under lay control.

This action with regard to child welfare is not comparable to the situation which exists regarding tuberculosis, as claimed by Mr. J. Fred Davey, president of the Canadian Council on Child and Family Welfare, in a published statement. The Department of National Health has never had a Division on Tuberculosis, whereas its organization included for many years a Division on Child Welfare. The Dominion Government has not relinquished any of its responsibility in the field of tuberculosis; the situation is now as it has always been. It is one thing not to organize a division; it is quite another to organize one and then to relinquish duties set out in the Act under which the Department functions.

Opposition was voiced in the House of Commons by Mr. Stewart, of Edmonton, and Mr. Speneer. The Canadian Social Hygiene Council and the Executive Committee on the National Council of Women of Canada have passed resolutions expressing disapproval.

Of even greater importance than this one event is that the move appears to be but one more step in the disintegration of the Department of National Health. Activities have been dropped, expenditures decreased, and no new activities undertaken.

If the Canadian Medical Association believes that the Dominion should, through its Department of National Health, give leadership to public health in Canada, then the Canadian Medical Association should not only oppose the giving up of responsibilities, but should urge upon the Government that a sound policy for public health under Dominion inspiration and leadership should be regarded as a responsibility of the Dominion.

The following resolution, which was approved by the Executive Committee, then received the unanimous approval of Council of the Canadian Medical Association:—

WHEREAS the Canadian Medical Association, having from its inception urged upon the Dominion Government the desirability of establishing a Department of National Health, is naturally and logically interested in any action affecting that Department; and

WHEREAS the original Act of 1919 creating the Department, and the Department of Pensions and National Health Act of 1928, set out as a specific duty, "cooperation with the provincial, territorial and other health authorities with a view to the coordination of the efforts proposed or made for . . . the conservation of child life and the promotion of child welfare"; and

WHEREAS the Canadian Medical Association has learned of the discontinuance of the Division of Child Hygiene of the Department of Pensions and National Health and the transference of the functions of the Division to the Canadian Council on Child and Family Welfare, it having been stated by the Minister of Pensions and National Health that, "To some extent the work of the Department is a duplication of that carried on by the Provincial Health Departments and particularly the Canadian Council on Child and Family Welfare", and "It is considered that the Canadian Council on Child and Family Welfare could acceptably perform the work now being carried on by the Child Welfare Division of the Department with satisfaction to the health agencies of Canada and to the public at large"; and WHEREAS this action has resulted in the transference of two medical problems, maternal and child hygiene, from a Department under scientifically qualified whole-time medical administration, from a Division of that Department under immediate medical direction to an organization under a non-medical director; and

WHEREAS this reverses the generally accepted policy of the correct relationship which should exist between an official and a non-official health agency, that non-official agencies shall transfer proved pieces of public health work to the official agencies as rapidly as the latter can absorb them;

BE IT RESOLVED THAT—

- (1) The Canadian Medical Association places itself on record as being opposed to the Dominion Government transferring public health activities for which it has assumed statutory responsibility through the Department of Pensions and National Health, Canada.
- (2) The Canadian Medical Association recognizes the place and value of voluntary health organizations, and approves of their receiving grants-in-aid from Governments, but does not approve of the discontinuance of functions by an official agency to eliminate duplication of work with a voluntary agency subsidized from official sources; and
- (3) The Canadian Medical Association believes that medical problems such as maternal and child hygiene should be administered by an organization under general and immediate medical direction; and
- (4) That the Canadian Medical Association reiterate its belief that the Dominion Government should provide inspiration and leadership in the field of public health in Canada.
- (5) That a copy of this resolution be forwarded to the Right Honourable the Prime Minister of Canada and the Honourable the Minister of Pensions and National Health.

INVITATIONS FOR FUTURE ANNUAL MEETINGS

The Montreal Medico-Chirurgical Society invites the Association to meet in Montreal in 1935. This invitation is most cordially endorsed and supported by the Province of Quebec Medical Association.

We have an invitation from the Western Ontario Academy of Medicine to meet in London at some early convenient date. For 1936, we have invitations from both Victoria, B.C., and Fort William, Ont.; and the Ottawa Medico-Chirurgical Society has issued an invitation for the meeting in 1937.

These invitations will be referred to the Nominating Committee for consideration and report.

Approved.

In addition to the invitations, mentioned above, the General Secretary reported the receipt of the following telegrams from the Secretary of the American Medical Association:—

"House of Delegates of American Medical Association unanimously and enthusiastically approve proposal of Board of Trustees to extend invitation to Canadian Medical Association to join with American Medical Association in scientific session in 1935. Session to be held Atlantic City probably during second week in June."

OLIN WEST, *Secretary,*
American Medical Association.

"Regret that it is not possible to state definitely time of Atlantic City session. Will recommend June 3-7, or June 10-14. Invitation extended to your Association with utmost possible cordiality and enthusiasm. Please accept sincerest good wishes for success for your meeting at Calgary."

OLIN WEST, *Secretary,*
American Medical Association.

This invitation was considered by the Nominating Committee on Monday afternoon, June 18th, and the Committee recommended to Council that it be accepted. Council gave unanimous approval to the acceptance of this invitation. Representatives of the Montreal Medico-Chirurgical Society and the Province of Quebec Medical Association stated that it would be quite in order for the acceptance of the invitation to Montreal to be deferred until a later year should Council decide to accept the invitation to meet jointly with the American Medical Association in 1935.

DINNER TO SUN LIFE OFFICIALS

On the evening of April 7th, the Executive Committee forgathered at the Montreal Hunt Club to be dinner hosts to Mr. A. B. Wood, recently elected to the high position of President and Managing Director of the Sun Life Assurance Company of Canada. Mr. Wood was accompanied by the following officers from his Company:—Mr. McNutt, Vice-President, Mr. Burke, Actuary, Dr. Hamilton, Medical Consultant, and Dr. C. C. Birchard, Chief Medical Officer. Past-President, Dr. A. Primrose, who acted as Chairman, presented to Mr. Wood a memorial volume in which the medical profession throughout Canada expressed its great satisfaction in having enjoyed for a period of seven years, extra mural post graduate lectures, which had been made possible by the generosity of the Sun Life Assurance Company. In replying, Mr.

Wood expressed his appreciation of the dinner and the volume which had been presented to him. He further indicated that his Company was pleased to be associated with us, and expressed the hope that, when normal conditions return, it may be possible for his Company once more to finance a post-graduate department in our Association.

Approved.

ILLNESS OF OUR CHAIRMAN

Due to ill health, Dr. Bazin, the Chairman of this Committee, has been compelled to take several months' rest. This made it necessary, in April, to appoint an Acting Chairman of this Committee and of Council. Dr. Geo. S. Young was the unanimous choice of the Executive Committee. Dr. Bazin has given freely of his time and outstanding ability to the affairs of the Association for a number of years, and we are all deeply indebted to him for his efforts on behalf of organized medicine in Canada. It is, therefore, quite unnecessary for your Committee to do more than say how extremely sorry we are to be deprived of his cooperation. We bespeak for Dr. Bazin an early and complete recovery, and trust that he will soon be among us again to give us the value of his experience and wisdom.

Approved.

DR. F. N. G. STARR

With profound regret your Committee records the loss by death of one of its members in the person of Dr. Frederic Newton Gisborne Starr. Dr. Starr was elected General Secretary of the Association forty-one years ago, and held that office from 1893 to 1901. In 1927, he was elevated to the office of President, the highest position in the gift of the Association. For more than forty years, Dr. Starr was an untiring, sympathetic, constructive supporter of the Canadian Medical Association. In his quiet way, he could always be counted upon to say the appropriate word under any and all conditions. The Association and Council have sustained an irreparable loss in the passing of Dr. Starr. To his widow, we tender our deepest sympathy.

Approved.

CONCLUSION

In this report, your Committee has dealt with a number of activities and problems as presented for solution during the past year. This report, together with a perusal of the many other reports presented herewith, gives conclusive evidence of the wide and varied activities in which your Association engages on behalf of the medical profession of Canada. We look back upon what has been accomplished during the past year with a certain degree of satisfaction. We look forward to the future with confidence, believing that our Association will continue to serve a very useful purpose in the national life of our country.

All of which is respectfully submitted.

GEO. S. YOUNG,
Acting Chairman.
T. C. ROUTLEY,
General Secretary.

Approved.

REPORT OF THE DEPARTMENT OF HOSPITAL SERVICE

Mr. Chairman and Members of Council:—

In the year's interval since the last meeting of Council, the Department of Hospital Service, now in its seventh year, has continued to be of much assistance to

the hospital field. In the operation of a Department such as this much work is of a routine nature, such as collecting and indexing articles and information on the many phases of hospital work, while the other ever increasing aspect of the work has to do with the special problems of individual hospitals or hospital districts which are so frequently referred to this office.

Perhaps the major development of the past year was the successful meeting of the Canadian Hospital Council at Winnipeg, September 7-9, 1933. The Canadian Hospital Council is an organization of the hospital associations in Canada with the federal and the provincial health departments, the creation of which has been sponsored by the Department of Hospital Service, which is also a member of the Council. While this Council was formed at an initial meeting in 1931, to meet biennially, it was the 1933 meeting which enabled the Council to make distinct progress in the study of the many problems facing hospitals and their staffs. During the previous two years a number of non-operative committees, with the assistance of this Department, had been preparing studies of various major problems and these reports have since been printed and given wide distribution.

The list of hospitals approved for internship has again been revised. During the past year the Hôpital Notre Dame, Montreal, the Hôpital Ste. Justine, Montreal, the Hôpital Ste. Sacrament, Quebec, the Woman's General Hospital, Montreal, the Edmonton General Hospital and the Vancouver General Hospital have been placed upon the "approved" list and the Regina Grey Nuns' Hospital has been added to the "recommended" list. The list now includes 35 approved hospitals with 501 internships (excluding residencies) and 14 recommended hospitals with 52 internships. Reports received periodically indicate that the establishment of this register has resulted in a very definite improvement in many hospitals in the internship arrangements, in the staff organization, the post-mortem percentage and the library facilities. We are deeply indebted to the members of the Committee on Approval for their kind cooperation in this work.

During the year a number of surveys of institutions have been made; the secretary has attended and participated in all provincial and various other hospital conventions; he represented the Canadian hospitals on the program of the Hospital Day celebration at the Century of Progress Exposition. A number of contributions have been made to hospital and other magazines. A study of nursing ratios has been made for the Joint Study Committee on Nursing; various customs and excise tariff details, including a request for a revised tariff arrangement for pollen extracts, have been taken up with Ottawa at the request of physicians and hospital administrators. This Department has participated with other bodies, including the Dominion Bureau of Statistics, in an effort to establish greater co-ordination in the basis of compiling hospital statistics and definite progress has already been made. There is much need for a unified basis of accounting to permit more intelligent comparison of hospital data, any comparison at the present time being practically worthless. Fewer hospitals have been visited, partly because of increased office demands but largely because of a decreased budget.

Much attention has been given to the subject of "group hospitalization" or the prepayment plan for hospital care, a movement which has received much impetus in Canada and the United States during the past few years. The relations of the medical staff to hospitals have received considerable study also. Unfortunately it is becoming increasingly difficult to cope with the many requests for information and studies which are being received. This has become more so since the reduction in the staff of this Department last year in the interests of economy. If the work is to be properly conducted, particularly in view of the steadily increasing demands on this Department, it would seem almost essential that the staff be restored to its former quota.

To our benefactors, the Sun Life Assurance Company of Canada, whose continued interest and generosity have made this work possible, we extend our deepest appreciation. In doing so we echo the similar and frequently

expressed gratitude of many hospital workers throughout Canada who have so often voiced their appreciation of the assistance which this Department of Hospital Service, thanks to our patrons, has been enabled to give them.

All of which is respectfully submitted.

HARVEY AGNEW,
Secretary.

Approved.

In discussing this report, the opinion was expressed that the operation of this Department is one of the most important activities that the Canadian Medical Association has ever undertaken.

REPORT OF THE COMMITTEE ON PUBLIC HEALTH AND MEDICAL PUBLICITY

Mr. Chairman and Members of Council:—

This report is a brief resumé of the activities of the Department of Publicity and Health Education.

At a time when public health services are being curtailed, it is of increasing importance that health education of the public be continued and, if possible, expanded, to assist in the maintenance of public health.

The Department has continued to offer regular articles each week to the newspapers of Canada. During the past year, several additional newspapers have requested the service, notably the French-language newspaper which has the largest circulation in the province of Quebec. At present, 369 newspapers publish the articles, 345 in the English language and 24 in the French language.

The correspondence growing out of the Health Service continues at about the same level, 1,484 letters having been answered in 1933. More and more correspondents have written a second and a third time, expressing satisfaction with our previous replies. A number of schools have written for information on such subjects as patent medicines, growing out of advice given in one school text-book to write to the Canadian Medical Association for such information.

Serious consideration was given to the question of pamphlets. The conclusion reached was that this field is fairly well covered by existing agencies. Attention was drawn to the lack of authoritative health literature to be sold in book-stores or in the book departments of large shops. A careful study has convinced the Department

that there is need for a series of booklets on health subjects, to be sold at a nominal sum. Arrangements have been completed with a Canadian publishing house, and these books will be placed on sale at the beginning of next year.

It is again a very pleasant duty to acknowledge the fine service rendered the Department of Publicity and Health Education during the past year, by Doctor Grant Fleming, Associate Secretary in charge of the Department, and his assistant, Miss M. McCrory.

All of which is respectfully submitted.

J. G. FITZGERALD,
Chairman.

Approved.

REPORT OF THE CENTRAL PROGRAM COMMITTEE

Mr. Chairman and Members of Council:—

The work of the Central Program Committee has been greatly facilitated by the promptness of the Local Committee in Calgary. In fact the general plan for this meeting was in our hands last fall. While certain names were suggested for the scientific program, the Calgary Committee made it clear that the final choice would be left entirely to the Central Program Committee. This Committee has had frequent sessions since last fall and every effort has been made to build up a well-balanced program which might be interesting and instructive. As in the past your Committee is deeply indebted to the Secretary's office for very valuable help in correspondence and other details. It may be of interest to know that, in the Committee's work, it has been necessary to send out 425 letters.

All of which is respectfully submitted.

GEO. S. YOUNG,
Chairman.

Approved.

Following discussion of this report, the following resolution was passed:—

"That, in future, the Central Program Committee be invested with power to take full charge of preparations for the annual meeting, and that, in the proposed revision of the By-Laws, this matter be provided for."

REPORT OF THE HONORARY-TREASURER

Mr. Chairman and Members of Council:—

I have the honour to submit the report of the Honorary-Treasurer of the Association for the year ending December 31, 1933. Appended is the report of the Association's auditors, Messrs. Clarkson, McDonald, Currie & Co.

In spite of a continued falling off in membership fees, subscriptions and advertising in the *Journal*, certain economies, particularly in *Journal* costs, and in administration expenses, have permitted a balancing of our budget so successfully that a favourable balance of \$1,364.87 is reported.

Membership fees were less by \$2,188.90, subscriptions by \$1,489.75, and advertising by \$1,605.69. Offsetting this was an increased revenue from investments of \$643.14, a reduction in *Journal* expenses of \$3,408.60 and in administration of \$645.12.

The surplus account of the Association now stands at \$77,006.89. These funds are mainly invested in trustee securities, with a book value of \$63,628.75. The market value is still slightly lower and on December 31, 1933 was \$61,292.00. A few of our investments, it was found, were in non-trustee securities. These are being transferred to trustee securities as soon as the change can be effected without loss of capital. It has not been possible to make any further capital investment during the year.

SECURITIES

It was deemed advisable to exchange certain securities for similar but longer term bonds and the following transactions were made.

EXCHANGES, 1933, GENERAL FUND

\$2,000 Dominion of Canada.....	4½% 1946, bought at \$ 97.00, sold at \$ 99.00; replaced by				
2,000 Province of Quebec.....	4½% 1963, " " 98.50.				
5,000 Montreal Light, Heat & Power (a non-trustee security) 5 % 1970, " " 103.00, " " 101.00; " "					
5,000 City of Montreal.....	5 % 1954, " " 101.00.				
£1,000 Grand Trunk Railway.....	4 % Debent. " " 85.50, " " 85.625; " "				
\$5,000 Province of Ontario.....	4½% 1950, " " 99.00.				
£ 500 City of Montreal.....	4½% 1949, " " 94.50, " " 102.00; " "				
\$ 500 Dominion of Canada.....	4½% 1958, " " 98.00, and				
2,000 Canadian National Railway...	4½% 1951, " " 99.75.				

LISTER CLUB FUND

\$1,000 Dominion of Canada.....	4½% 1940, bought at \$98.55, sold at \$99.75; replaced by				
1,000 Province of Quebec.....	4½% 1963, " " 98.50.				

OSLER MEMORIAL FUND

£100 City of Montreal.....	4½% 1949, bought at \$94.50, sold at \$102.00; replaced by				
\$500 Dominion of Canada.....	4½% 1958, " " 98.00.				

SPECIAL GRANTS AND TRUST FUNDS

The statements of Special Grants and Trust Funds, found in the accompanying schedules, show a healthy condition. The amount standing to the credit of the Post-graduate Fund represents equipment which it is earnestly hoped may be put to use again in the near future.

The first payments from the Osler Scholarship Fund were made during the year to Dr. G. T. Evans and Dr. Gordon Copping, each candidate receiving \$800.

All of which is respectfully submitted.

F. S. PATCH,
Honorary-Treasurer.

AUDITOR'S REPORT

DR. FRANK S. PATCH,
Honorary-Treasurer,
Canadian Medical Association,
3640 University Street, Montreal.

Dear Sir:—

We beg to report that we have completed an audit of the books and accounts of the Association for the year ended 31st December, 1933, and we attach the following:—

Statement No. 1.—Balance Sheet as at 31st December, 1933.

Statement No. 2.—Statement of Revenue and Expenditure for the year ended 31st December, 1933.

Schedule No. 1.—Schedule of Investments as at 31st December, 1933.

Schedule No. 2.—Schedule of Trusts and Trust Funds as at 31st December, 1933.

Schedule No. 3.—Schedule of Special Grants and Special Grant Funds as at 31st December, 1933.

The receipts and disbursements of the General Secretary in Toronto as shown on a statement, certified to by Mr. Dignam as Auditor, have been incorporated in the books.

We verified the cash on hand and in bank and received confirmation of the securities which are held in safekeeping for Investment Account and for Trusts.

We found the books and accounts in excellent order and were given every assistance in the conduct of our audit.

Subject to the above remarks, we report that, in our opinion, the attached Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Association's affairs as at 31st December, 1933, according to the best of our information and the explanations given to us and as shown by the books.

Yours faithfully,

(Signed) CLARKSON, McDONALD, CURRIE & Co.,
Chartered Accountants.

STATEMENT No. 1

BALANCE SHEET AS AT 31st DECEMBER, 1933

ASSETS		
Cash on Hand:		
Montreal.....	\$25.00	
Toronto—Annual Meeting.....	16.05	
	<u>\$</u>	41.05
Cash in Bank:		
Montreal.....	\$7,918.05	
Toronto:		
General Funds....	223.44	
Annual Meeting..	3,705.68	
	<u>\$11,847.17</u>	
		\$11,888.22
ACCOUNTS RECEIVABLE:		
Advertising.....	\$1,515.81	
Reprints.....	431.56	
Printing and Journal Sales....	126.65	
Trust Funds.....	221.04	
	<u>\$</u>	2,295.06
INVESTMENTS:		
At Book Value, Schedule No. 1	\$63,628.75	
Accrued Interest on Investments	745.14	
	<u>\$64,373.89</u>	
Motor Emblems on Hand (at cost).....	3.75	
Trust Funds as per Schedule No. 2.....	30,057.79	
Special Grant Funds as per Schedule No. 3..	1,862.87	
Furniture and Fixtures—less depreciation....	813.91	
	<u>\$111,295.49</u>	

LIABILITIES		
Accounts Payable and Advertising Prepaid...	\$ 2,267.34	
Prepaid Subscriptions 1934.....	100.60	
Trusts as per Schedule No. 2.....	30,057.79	
Special Grants as per Schedule No. 3.....	1,862.87	
SURPLUS ACCOUNT:		
Balance at Credit, 1st January, 1933.....	\$75,423.99	
Add:		
Net Profit from Sale of Investments.....	53.92	
Excess Revenue for Year, as per Statement No. 2.....	1,364.87	
Exchange Adjustment <i>re</i> 1932 Revenue Items received in Sterling and now transferred to Canadian Funds.	164.11	
	<u>\$77,006.89</u>	

\$111,295.49

Submitted subject to our report of this date.

(Signed) CLARKSON, McDONALD, CURRIE & Co.,
Chartered Accountants.(Signed) F. S. PATCH,
Honorary-Treasurer.
Montreal, 26th March, 1934.STATEMENT No. 2

STATEMENT OF REVENUE AND EXPENDITURE FOR YEAR ENDED 31st DECEMBER, 1933

REVENUE		EXPENDITURE	
Membership Fees.....	\$26,087.60	JOURNAL EXPENSES:	
Subscriptions.....	2,230.54	Printing.....	\$22,548.60
Advertising.....	25,239.55	Illustrations.....	864.76
Sundry Sales of Journal.....	193.36	Agent's Commission.....	2,919.31
Excess Revenue from Annual Meeting.....	721.73	Editorial Salaries.....	7,422.00
Revenue from Investments and Bank Interest	3,522.28	Editorial Expenses.....	1,449.58
Sale of Motor Emblems.....	61.50		<u>\$35,204.25</u>
Sale of Nursing Survey Reports.....	2.00	ADMINISTRATION AND FINANCIAL EXPENSES:	
Sale of Periodic Health Forms.....	2.00	General Expenses.....	\$ 534.36
Sale of "Book of Canada".....	2.00	Travelling Expenses.....	3,373.27
Premium, Discount and Exchange (Net)....	106.29	Office Expenses General Secretary.....	418.65
		Postage.....	628.07
		Salaries—General Secretary....	8,190.00
		Other.....	7,672.60
		Stationery and Printing.....	268.13
		Telephone and Telegrams....	254.67
		Bad Debts.....	45.60
		Committee on Economics....	32.75
		Index 1911-1930.....	91.19
		Depreciation of Furniture and Fixtures, 10%.....	90.44
			<u>\$21,599.73</u>
		Excess Revenue for Year—Transferred to Surplus Account as per Balance Sheet	1,364.87
	<u>\$58,168.85</u>		<u>\$58,168.85</u>

SCHEDULE No. 1
SCHEDULE OF INVESTMENTS AS AT 31st DECEMBER, 1933
GENERAL FUND

	Par Value	Book Value
Canadian National Railways 4½/51.....	\$9,000.00	
Canadian National Railways 4½/54.....	3,000.00	\$8,892.10
City of Montreal 4½/46.....	1,000.00	2,896.50
City of Montreal 5/54.....	5,000.00	975.00
City of Toronto 4½/42.....	2,000.00	5,050.00
City of Winnipeg 4½/50.....	4,000.00	1,935.00
Dominion of Canada 5½/34.....	5,000.00	3,871.20
Dominion of Canada 5/43.....	5,100.00	5,072.50
Dominion of Canada 4½/58.....	500.00	5,010.75
Island of Montreal Metropolitan Commission 5/49.....	2,000.00	490.00
Montreal Tramways 5/41.....	5,000.00	2,006.00
Montreal Tramways 5/55.....	2,000.00	4,964.00
Province of Ontario 4½/39.....	1,000.00	1,940.60
Province of Ontario 5/48.....	2,000.00	986.30
Province of Ontario 4½/50.....	5,000.00	2,035.00
Province of British Columbia 4/57.....	5,000.00	4,950.00
Province of New Brunswick 4—3/4/36.....	1,000.00	4,775.00
Province of Quebec 4½/63.....	2,000.00	1,003.80
Province of Saskatchewan 4½/45.....	1,000.00	1,970.00
Province of Saskatchewan 4½/60.....	3,000.00	970.00
Ritz Carlton Hotel Co. First Mortgage 5/42.....	1,000.00	2,835.00
	<u>\$64,600.00</u>	<u>\$63,628.75</u>
Approximate Market Value, \$61,292.00.		

LISTER CLUB FUND:

City of Winnipeg 5/43.....
Province of Quebec 4½/63.....

TRUST FUNDS

Approximate Market Value, \$4,680.00.		
OSLER MEMORIAL FUND:		
Dominion of Canada 4½/57.....	\$4,000.00	\$4,021.20
Dominion of Canada 4½/58.....	1,000.00	985.00
Dominion of Canada 5½/34.....	<u>\$5,000.00</u>	<u>\$5,006.20</u>
Montreal Tramways 4½/55.....		
Montreal Tramways 5/55.....		
Pacific Great Eastern Railway 4½/42.....	\$ 900.00	\$ 918.00
	500.00	490.00
	50.00	50.42
	1,500.00	1,342.65
	1,000.00	1,002.50
	1,500.00	1,492.95
	<u>\$5,450.00</u>	<u>\$5,296.52</u>
Approximate Market Value, \$4,642.50.		
OSLER SCHOLARSHIP FUND:		
City of Quebec R.C. Schools 5/55.....		
Montreal Protestant Schools 5/52.....		
	\$10,000.00	\$10,003.00
	2,000.00	1,995.60
	<u>\$12,000.00</u>	<u>\$11,998.60</u>
Approximate Market Value, \$11,760.00.		
BLACKADER LECTURE FUND:		
Dominion of Canada 4½/46.....		
Dominion of Canada 4½/57.....		
Province of Alberta 4½/56.....		
Three Rivers R.C. Schools 5½/44.....		
	\$ 200.00	\$ 195.00
	200.00	204.00
	1,000.00	1,000.30
	3,000.00	3,030.00
	<u>\$4,400.00</u>	<u>\$4,429.30</u>
Approximate Market Value, \$4,096.00.		
BLACKADER LIBRARY OF THE HOSPITAL SERVICE DEPARTMENT:		
Canadian Northern Ontario Railway 3½% Debentures 1961.....		
Approximate Market Value, \$285.00.		
	£63	\$238.20

SCHEDULE No. 2

SCHEDULE OF TRUSTS AND TRUST FUNDS AS AT 31st DECEMBER, 1933

		<u>Trust Funds</u>	<u>Trusts</u>
LISTER CLUB FUND:			
Capital, 1st January, 1933.....	\$5,030.41		
Add—Profit on Sale of Investments.....	11.95		
	<u>5,042.36</u>		
Accumulated Revenue, 1st January, 1933.....	\$975.57		
Revenue for Year.....	260.57		
	<u>\$1,236.14</u>		
Deduct—Oration Expenses.....	783.41		
	<u>\$452.73</u>		
			\$ 5,495.09
Represented by—			
Investments as per Schedule No. 1.....	\$5,006.20		
Cash in Bank (less Account Payable).....	488.89		
	<u>\$5,495.09</u>		
OSLER MEMORIAL FUND:			
Capital, 1st January, 1933.....	\$5,272.87		
Add—Profit on Sale of Investments.....	36.05		
	<u>\$5,308.92</u>		
Accumulated Revenue, 1st January, 1933.....	\$602.81		
Revenue for Year.....	280.37		
	<u>\$ 883.18</u>		
			\$6,192.10
Represented by—			
Investments as per Schedule No. 1.....	\$5,296.52		
Cash in Bank (less Account Payable).....	882.98		
Account Receivable.....	12.60		
	<u>\$6,192.10</u>		
OSLER SCHOLARSHIP FUND:			
Capital, 1st January, 1933.....	\$12,087.30		
Add—Profit on Sale of Investments.....	21.60		
	<u>\$12,108.90</u>		
Accumulated Revenue, 1st January, 1933.....	\$307.72		
Revenue for Year.....	641.62		
	<u>\$ 949.34</u>		
			\$13,058.24
Represented by—			
Investments as per Schedule No. 1.....	\$11,998.60		
Cash in Bank (less Account Payable).....	1,059.64		
	<u>\$13,058.24</u>		
BLACKADER LECTURE FUND:			
Capital.....	\$4,454.14		
Accumulated Revenue, 1st January, 1933.....	\$348.96		
Revenue for Year.....	238.16		
	<u>\$ 587.12</u>		
			\$5,041.26
Represented by—			
Investments as per Schedule No. 1.....	\$4,429.30		
Cash in Bank (less Account Payable).....	611.96		
	<u>\$5,041.26</u>		
BLACKADER LIBRARY OF THE HOSPITAL SERVICE DEPARTMENT:			
Balance, 1st January, 1933.....	\$282.17		
Revenue received during year.....	10.35		
Donation received during year.....	50.00		
	<u>\$342.52</u>		
Less Expenditure—Books, Binding, Literature, etc.....	71.42		
	<u>\$271.10</u>		
Represented by—			
Investments as per Schedule No. 1.....	\$238.20		
Cash in Bank (less Account Payable).....	32.90		
	<u>\$271.10</u>		
			<u>\$30,057.79</u>
			<u>\$30,057.79</u>

SCHEDULE No. 3

SCHEDULE OF SPECIAL GRANTS AND SPECIAL GRANT FUNDS AS AT 31st DECEMBER, 1933

		<i>Special Grant Funds</i>	<i>Special Grants</i>
POST-GRADUATE DEPARTMENT:			
Balance at Credit, 1st January, 1933.....	\$2,007.66		
Deduct—Balance of Cash in Bank and on Hand transferred to credit of Department of Hospital Service.....	1,211.95		
	<u>\$795.71</u>		
Depreciation of Equipment.....	79.57		
Balance at Credit, 31st December, 1933.....			\$716.14
Represented by—			
Equipment—Less Depreciation.....		\$716.14	
DEPARTMENT OF HOSPITAL SERVICE:			
Balance at Credit, 1st January, 1933.....	\$6,422.38		
Transfer of Balance of Funds from Post Graduate Department.....	1,211.95		
Grant from Sun Life Assurance Company.....	6,100.00		
Bank Interest.....	102.13		
	<u>\$13,836.46</u>		
Deduct—Salaries.....	\$9,173.45		
Travelling Expenses.....	1,636.76		
Printing, Stationery, Literature and Office Sup- plies.....	1,802.84		
Postage.....	174.28		
General Expenses.....	250.15		
Depreciation of Equipment, 10%.....	68.74		
	<u>\$13,106.22</u>		
Balance at Credit, 31st December, 1933.....			\$730.24
Represented by—			
Cash in Bank.....	\$1,391.44		
Less—Accounts Payable.....	1,279.81		
	<u>\$111.63</u>		
Furniture and Equipment—Less Depreciation.....	\$618.61		
(Expenditure, \$13,106.22; Revenue, \$7,414.08; Excess Expendi- ture for Year, \$5,692.14.)		\$730.24	
DEPARTMENT OF PUBLICITY AND HEALTH EDUCATION:			
Balance at Credit, 1st January, 1933.....	\$1,336.41		
Grant from Canadian Life Insurance Officers' Association.....	\$5,000.00		
Bank Interest.....	25.21		
	<u>\$3,361.62</u>		
Deduct—Salaries.....	\$4,861.00		
Travelling Expenses.....	89.30		
Postage.....	745.94		
Office Supplies and General Expenses.....	55.35		
Stationery, Printing and Literature.....	167.95		
Depreciation of Furniture and Equipment, 10%.....	25.59		
	<u>\$5,945.13</u>		
Balance at Credit, 31st December, 1933.....			\$416.49
Represented by—			
Cash in Bank.....	\$288.54		
Less—Account Payable.....	102.32		
	<u>\$186.22</u>		
Furniture and Equipment—Less Depreciation.....	\$230.27		
(Expenditure, \$5,945.13; Revenue, \$5,025.21; Excess Expendi- ture for year, \$919.92.)		\$416.49	
		<u>\$1,862.87</u>	<u>\$1,862.87</u>

Approved.

REPORT OF THE EDITOR

Mr. Chairman and Members of Council:—

Owing to the fact that it was necessary, from the financial point of view, to keep the size of the *Journal* about the same as it was last year, namely, 114 pages, much good matter offered for publication has had to be declined or held over for a considerable time. The number of papers received was 318, of which 51 were refused for various reasons. As before, the illustrations have been reduced to the minimum and, where possible, have been grouped in blocks, thereby saving expense.

The series of papers which we have been publishing on Medical Education has come to an end, as also the second series on Physiotherapy. A series on the early diagnosis of cancer, written specially for the *Journal* by well-known authorities, has been appearing this year. In the main, these papers have been short and to the point, and should prove helpful. A new Section, that of Economics, has been created. In it the economic situation in various parts of Canada as it affects the profession has been fairly fully dealt with by means of articles specially written to cover various phases of the subject and by news items. British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, and New Brunswick have received attention, and the subject is still being pursued. Another new Section, Notes on the British Pharmacopœia and Canadian Formulary, has been started, and Drs. V. E. Henderson and G. H. W. Lucas, of the University of Toronto, have furnished us with many informative and practically useful comments.

The quality of the articles submitted for publication has been, on the whole, excellent, and more care in the authors' preparation of the manuscripts is becoming evident. Special mention, perhaps, may be made of the following:—"The Fourth Listerian Oration," by Prof. Robert Muir; "Status Lymphaticus," by Dr. W. N. Kemp, an article which received considerable attention, editorially, in the *British Medical Journal*; "Some Aspects of the Menopause," by Prof. B. Whitehouse; "Sterilization of the Feeble-Minded," by Hon. Dr. H. A. Bruce; "The Position of the Circulation in Nephritis," by Prof. H. Oertel; "Experimental Intestinal Obstruction," by Drs. N. B. Taylor, C. B. Weld, and G. K. Harrison; "The Outlook for overcoming Pneumonia," by Dr. Rufus Cole, of New York; "Some unusual Manifestations of Tuberculosis," by Sir Humphry Rolleston; "Clinical Studies with the Urca Clearance Test," by Drs. L. G. Bell, C. R. Gilmour, and A. T. Cameron; "Tuberculous Rheumatism," by Dr. A. LeSage; "Dinitrophenol," by Dr. I. M. Rabinowitch; "Intestinal Parasites in Montreal," by Dr. Annie Porter; "Entamoeba Histolytica and Colitis in Montreal," by Dr. R. H. M. Hardisty; "The Chemical Nature of the Fat-Soluble Vitamin of Growth," by Prof. M. Javillier, of the Sorbonne; "The Factors concerned in Intracellular Absorption," by Dr. H. C. Connell; "Bilirubin Formation and the Reticulo-endothelial System," by Dr. R. Gottlieb; "Staphylococcus Infection in Diabetes Mellitus," by Drs. J. A. Gilchrist and M. J. Wilson; "Electrocardiographic Studies of the Dying Heart in Angina Pectoris," by Drs. R. L. Hamilton and H. Robertson. The length of this list is an index of the high quality of the material published this year in the *Journal*.

Worthy of note under "Men and Books" are:—"The Reading of History" by Sir Andrew Macphail; "The Early Medical History of Edmonton," by Dr. H. C. Jamieson; "John Hutchison Garnier," by Dr. W. V. Johnston; "Dr. Thomas Clisholm, M.P.," by Dr. F. A. Clarkson; "Sir William Osler—Parasitologist," by Dr. T. W. M. Cameron; and "Hereditry and the Social Problem Group," by Dr. Madge T. Macklin.

Rare cases reported were:—Cholecystitis glandularis proliferans, by Dr. F. W. Wiglesworth; Primary Carcinoma of the Lung in a Child, by Dr. J. M. Beardsley; Granulomatous Myocarditis, by Prof. James Miller; Infection with *Strongyloides stercoralis*, by Prof. F. T. Cadham; Neurinoma of the Vault of the Palate, by Dr. P. Panneton; Superficial Abdominal Gangrene as a Complication of Varicella, by Dr. T. R. Nichols; and Skin Infection due to *Alternaria tenuis*, by Dr. M. E. Borsook.

Great numbers of books have come in for review, among them the following by Canadian authors:—"Medicine in Canada," by Dr. W. B. Howell; "The Study of Anatomy," by Prof. S. E. Whitnall; "Surgical Pathology" (third edition), by Prof. William Boyd.

The editorials, in the main, have dealt with topics of practical importance, and have been planned with the idea of keeping our readers *au courant* with the latest developments of medical thought, both scientific and social. Among the subjects considered may be mentioned, Medical Education, Medical Economics, Unemployment Relief, the Early Diagnosis of Cancer, the Qualification of Specialists in Canada, Epidemic Encephalitis, Amœbiasis, the Fish Tape-worm, Brucella Infection, Poisoning with the Barbiturates, Dinitrophenol, Food and Drug Acts, the Ethics of Advertising, and the Physician's Responsibility in Prescribing.

We have endeavoured to group together papers on the same or allied topics and have often made editorial comment on these in the same issues. Also, "fillers" and items of the class used in "Topics of Current Interest" have been selected so as to supplement the articles referred to. All this has been done to concentrate interest and make reference more complete and accessible.

The Section of Abstracts is now more comprehensive than ever. It covers all departments of medicine, including the specialties, as well as physiology, biochemistry, and experimental medicine. A few French, German, and Italian journals are being abstracted. Some new abstractors have been secured, to take on subjects that have hitherto been only partially covered. Henceforth all branches will be regularly and systematically dealt with. When finances permit, it is hoped that this Section will be further improved.

The Section of "Letters, Notes and Queries" is gaining ground slowly, and we would commend it to our readers as a forum for the recording of experiences and the exchange of opinions.

During the period under review the Association has had the sad misfortune to lose no less than three of its Past-presidents, in the persons of Irving Cameron, John Stewart, and F. N. G. Starr. The *Journal* has published appropriate obituary notices of our late colleagues, which have been reprinted in separate form and sent to relatives and others interested, and to members of the Executive. Copies also, together with original photographs, blocks, and illustrations have been sent to Dr. C. F. Wyde, for deposit in the archives of the Association.

We are at the present time exchanging with 71 medical journals in various countries. We have been in touch with these, with the idea of learning what disposition is made of the *Canadian Medical Association Journal* after it has served its initial purpose. It is gratifying to find that it is valued and in almost every instance is bound for permanent preservation or donated to some medical library.

Some minor changes are planned in the format of the *Journal*, so as to facilitate indexing and bring our system more into line with generally accepted practice.

The Twenty-year Index is making satisfactory progress.

It is desirable that the various Sections of the Association should receive more specific notice in the pages of the *Journal*, and this would be much facilitated if their secretaries would furnish the Editor with their minutes, or excerpts from them, with recommendations as to publication of important matters. Papers read in the Sections should be handed to the General Secretary for transmission to the Editor. It is desirable also that secretaries of provincial medical associations and local medical societies should furnish the editor with accounts of their meetings, not bald statements but what would practically be brief abstracts of the papers read. This brings up the question of the publication of Presidential Addresses. Publication of these has been left to the discretion of the Editor. The ideal way would be to publish short abstracts of the presidential addresses together with the report of the meetings at which they were delivered, dealing only with essentials, and in the case of addresses of more than ordinary importance to deal with

them editorially, and, very exceptionally, to publish them in full. Up to the present the *Journal* has not often received adequate reports of the annual meetings of the provincial Associations, and frequently none at all.

The thanks of the Editorial Board are herewith extended to the officers of the Association who have so freely placed their knowledge and advice at its disposal, to the provincial editors, and to the many contributors who have made the *Journal* possible. In particular, its thanks are due to Drs. Arnold Branch, William Boyd, E. E. Shepley, and D. L. Thomson for writing special editorials by request; to Dr. L. F. Barker for contributing to the "Clinical Conferences;" to Drs. B. J. Brandson, F. J. H. Campbell, D. E. H. Cleveland, W. Alan Curry, W. H. McGuffin, J. C. Meakins, G. E. Tremble, and A. E. Whytock for their kindly assistance in preparing special articles on the early diagnosis of cancer; to Drs. T. E. Brown, Lillian Chase, G. E. Learmonth, J. H. MacDermot, Harris McPhedran, E. S. Moorhead, W. E. Park, J. Stevenson, C. J. Veniot, and Ward Woolner for their contributions to the Section of Economics. Finally, the Editor wishes to record his personal appreciation of the ready and efficient cooperation of Dr. H. E. MacDermot, the Assistant Editor, of the office staff, and of the Murray Printing Company.

All of which is respectfully submitted.

A. G. NICHOLLS,
Editor.

Approved.

REPORT OF THE COMMITTEE ON ETHICS

Mr. Chairman and Members of Council:—

Only one matter was referred to your Committee and dealt with by the nucleus at Kingston.

The Academy of Medicine, Toronto, complained that they could not get the Bell Telephone Company to list specialists in their general list and requested that pressure be brought to bear on the Company to concede this arrangement. The Company replied that the doctors had the right to place any information they desired in the special list and they could not see their way to alter their general list because they had agreements, in regard to this matter with associated companies. The nucleus committee felt that the matter might again be brought to the attention of the Company by the Executive Committee, but they themselves had no power to act in the matter.

All of which is respectfully submitted.

L. J. AUSTIN,
Chairman.

Approved.

Following discussion of this report, the following resolution was duly moved, seconded and approved:—

"That this Association make no pronouncement with regard to the listing of physicians' names in heavy type in the telephone directory; and that, in the opinion of Council, local circumstances should be taken into consideration in deciding a matter of this kind, along with the principles set forth in the Code of Ethics of the Association."

REPORT OF THE MANAGING EDITOR

Mr. Chairman and Members of Council:—

I have the honour to submit the report of Managing Editor of the *Journal* for the year ending December 31st, 1933.

This report is hardly separable from that of the Honorary-Treasurer and the main features of the year's activities have been reviewed in the latter's report. The economies imposed on us by the reduction of *Journal* receipts, membership fees, etc., have necessitated keeping the issues at a minimum size. This, it may be confidently asserted, has not resulted in any deterioration in the quality of the *Journal*.

Contributors to the *Journal* are frequently requested by the Editorial chair to reduce the number of their illustrations to the minimum. This is occasioned by economic pressure and the higher cost of illustrations. For half tones, the increase in cost, for the first five square inches, is 42.85 per cent; for zinc cuts 57-1/7 per cent. For additional measurements, the increase amounts to 20 per cent in both half tones and zinc cuts. In addition, a Government tax of 6 per cent is now payable on all cuts.

A comparative table of the *Journal* contents for the past four years is submitted:—

	1930	1931	1932	1933
Original Articles, Case Reports, Retrospects, Men & Books, Clinical & Laboratory Notes.....	290	267	258	271
Number of Pages—				
Text.....	1,812	1,614	1,424	1,376
Advertising.....	839	715	704	649
Illustrations.....	381	363	235	203
Journals issued...	55,775	55,565	53,420	50,700

All of which is respectfully submitted.

F. S. PATCH,
Managing Editor

Approved.

REPORT OF THE COMMITTEE ON PHARMACY

Mr. Chairman and Members of Council:—

The Canadian Pharmaceutical Association approached the Canadian Medical Association to ask whether this latter body would support them in bringing pressure to bear upon the Government to adopt certain amendments to the Patent and Proprietary Medicines Act. This, when referred to this Committee, led to a circular letter to all members asking their opinions on certain points which covered, and were in some cases wider, than the proposed amendments of the Canadian Pharmaceutical Association.

There was general agreement that any registered proprietary which contained one of the drugs scheduled in the Act should display on the bottle or package the word "poison," as numerous cases of poisoning have occurred from such proprietaries as A.B.S. and C. Tablets.

It was also generally felt that the limitation of the sale of registered proprietaries to drug stores alone would entail some hardships on people living in country districts. It may be noted in passing that several correspondents mentioned aspirin as a proprietary which it would be unfortunate to withdraw from groceries, etc. Yet this is not a registered proprietary and under the Pharmacy Acts of the various Provinces may not be so sold.

There was wide-spread thought and unanimous agreement that an amendment should be supported, preventing the peddling of registered proprietaries from door to door. The reasons underlying this suggestion are, that there are many cases known to Inspectors under the Provincial Medical Act, particularly in Ontario, where peddlers going from door to door and finding some one ailing have at once called attention to the virtues of the particular proprietary in which they deal. Evidence such that they can be prosecuted under either Provincial Medical or Pharmaceutical Acts is lacking and naturally almost impossible to obtain. Yet this practice is definitely at variance with the promotion of public health.

There was further general, but not unanimous, agreement that the Act should be so amended as to require that the preparation of any proprietary should be carried out by a pharmacist with Provincial registration. It is well known that lay persons with no medical, pharmaceutical or chemical knowledge often prepare such proprietaries. This may readily lead to inaccuracies which may be dangerous to the public health.

It was further generally agreed that in the case of those proprietaries which are not registered under the Patent and Proprietary Medicines Act, but fall under the Food and Drugs Act where it is required that the names of the ingredients must be given, that this latter Act should be amended so that the quantities also must be shown. This would, in part, prevent deception. For example, in the case of one of these proprietaries, as reported in the *Canadian Medical Association Journal* some years ago, the amount of bismuth was so small as to be completely valueless.

The Department of Health at Ottawa is very loath to introduce amendments to the Patent and Proprietary Medicines Act, as there is some question as to whether it is *ultra vires* of Dominion legislation, as it conflicts in part with the Provincial Pharmacy Acts.

The Canadian Medical Association would be well advised were it to press the Dominion Government to call a conference representative of the Medical and Pharmaceutical professions and the Provincial Governments, to consider the whole question of Patent and Proprietary Medicines, registered and unregistered, and of poisons, in regard to which there should be a uniform law.

All of which is respectfully submitted.

VELYIEN E. HENDERSON,

Chairman.

In connection with this report, exception was taken to the clause, "it is *ultra vires* of Dominion Legislation, as it conflicts in part with the Provincial Pharmacy Acts."

Dr. Heagerty expressed the opinion that, rather than to follow the suggestion of the report and call a conference representative of the medical and the pharmaceutical associations and the Provincial Governments to consider the question of patent medicines, it would be better to have a conference between the Canadian Medical Association and the Government. It was finally decided that this report should be referred back to the Committee on Pharmacy, along with the suggestions offered. The matter will engage the attention of the Executive Committee at a later date, when the Committee on Pharmacy is ready to report further.

REPORT OF THE POST-

GRADUATE COMMITTEE

Mr. Chairman and Members of Council:—

Last autumn, a team of speakers was supplied to the four Western Provinces and North Western Ontario. This year, a team is being sent to the Maritime Provinces.

Until such time as the work of the Department may be resumed on a scale commensurate with what has been done in the past, it is proposed that, when the annual meeting of the Association is held in the East, a team of speakers be provided for the West, and *vice versa*. In this way, the Department will at least be kept alive, and

we hope the time is not far distant when it may be possible to extend the work somewhat along the lines of former years.

All of which is respectfully submitted.

GEO. S. YOUNG,

Chairman.

Approved.

REPORT OF THE JOINT STUDY COMMITTEE ON NURSING EDUCATION

Mr. Chairman and Members of Council:—

Since our last annual report to this Association, the Joint Study Committee on Nursing Education has carried on as a national clearing house for the Provincial Committees, as well as giving consideration to some questions submitted by the Executive of the Canadian Nurses' Association. The work of organizing Provincial Study Committees was completed. In every province we have a study group working in co-operation with the Provincial Nursing and Medical Associations. We have arranged for the distribution of minutes from the provincial Joint Study Committees of Manitoba, Alberta and British Columbia, at their request, and will be pleased to extend this service to the other provinces if they so desire.

The Committee has held monthly meetings throughout the fall and winter, and has given a good deal of time to investigation of problems growing out of the Survey. As none of these have reached the reporting stage, we can only submit progress at this time.

Early in the year, the Committee asked the President of the Canadian Nurses' Association and the Secretary of the Department of Hospital Service of the Canadian Medical Association to become members of our group. This has been eminently satisfactory, and we would ask this Association to confirm the appointment of Dr. Agnew.

It is the general opinion of the Joint Study Committee that the committee should continue until the best form of permanent organization is decided upon and brought into operation. We recommend that this Association, by resolution, concur in the continuance of the Committee.

We regret very much to report the resignation from our Committee of Dr. A. T. Bazin of Montreal. It is doubly regrettable because indifferent health is the reason for his retirement.

In so far as the Canadian Medical Association is concerned, Dr. Bazin was a pioneer in urging investigation of the whole nursing problem. In the early years of the Joint Study Committee his counsel was always valuable, and he was always a kindly connecting link between the Committee and this Association. We trust that his health will soon be restored, and that he may continue to give his support to the Association he valued so much. It will be necessary for you to appoint a successor at this meeting.

All of which is respectfully submitted.

G. STEWART CAMERON,

Chairman.

Approved.

REPORT OF THE STUDY COMMITTEE ON CANCER

Mr. Chairman and Members of Council:—

Your Committee met in Toronto on April 21st, 1934. Discussion took place as to the desirability or otherwise of establishing in Canada some such organization as the British Empire Cancer Campaign. The object would be to co-ordinate effort in dealing with the cancer problem in all its aspects and in all parts of Canada.

This should be a national project formed under the ægis of the Canadian Medical Association.

It was resolved that it is desirable to form an organization that might be called "The Canadian Cancer Campaign" with affiliations as a branch of the British Empire Cancer Campaign and that this body should function in Canada much in the same manner as the parent organization in Great Britain. Furthermore it is suggested that before the formation of this body is undertaken, all organizations in Canada at present engaged in any work connected with the Cancer problem, should be asked their opinion as to the desirability of forming this national body and as to the possibility of co-operation in Canada between the various bodies concerned.

All of which is respectfully submitted.

A. PRIMROSE,

Chairman.

Approved.

REPORT OF THE COMMITTEE ON INTER-PROVINCIAL RELATIONS

Mr. Chairman and Members of Council:—

The Committee on Inter-Provincial Relations has been in communication with all the provinces. Replies were received from four. One offered no suggestions, the three others expressed views which were not strictly in accord with By-Law VIII of the Association, which reads as follows:—"It shall be the duty of the Committee on Inter-Provincial Relations to promote greater interest by Provincial Associations in the welfare of the Canadian Medical Association; to take cognizance of any problems arising from the action of any Provincial Association affecting other Provincial Associations or the Canadian Medical Association; and to review new activities of Provincial Associations and to communicate such to other Provincial Associations." The relations between the provinces have been most cordial. This year, By-Law VIII has not been active, but should remain unchanged so as to meet any emergency which may arise.

All of which is respectfully submitted.

G. CLOWES VAN WART,

Chairman.

Approved.

In discussing this report, the General Secretary pointed out that during the past year or two a very useful purpose has been served by a number of the Provincial Associations submitting copies of the minutes of their Executive Committee meetings (or such portions of these minutes as have a national interest) to the Central Office. Council recommended that this suggestion be passed on to all the Provincial Associations.

REPORT OF THE COMMITTEE ON MATERNAL WELFARE

Mr. Chairman and Members of Council:—

I have the honour to submit the following Report of the Committee on Maternal Welfare for the year 1933-1934.

Your Committee feels that attempts made to educate the public as to the great importance of maternal care and its relation to national and personal prosperity and

happiness have been so far only partly successful and would ask the Association to make an effort to interest the profession and all Provincial and local medical societies in bringing before the public the principles of maternal care and maternal welfare. The large majority of our people do not yet appreciate the supreme importance of pre-natal care. They do not realize that one-third of our maternal mortality is due to the toxæmias and that most of the toxæmias may be prevented. Nor do they realize that one-third of our maternal mortality is due to puerperal septicæmia and that puerperal septicæmia is a preventable disease. We lose three Canadian mothers every day in the year. One mother dies every day from puerperal sepsis. One mother dies every day from the toxæmias of pregnancy. The majority of these lives, amounting to nearly 1,200 every year, could and should be saved.

The following are the statistics in Maternal Mortality as supplied by the Dominion Bureau of Statistics.

ADDENDUM

MATERNAL MORTALITY IN CANADA IN 1932 AND THE FIRST NINE MONTHS OF 1933

	1932			1933*		
	All Puerperal Cases	Puerperal Septicæmia	Other Puerperal Causes	All Puerperal Cases	Puerperal Septicæmia	Other Puerperal Causes
Number of deaths.						
Canada.....	1,181	413	768	837	273	558
Prince Edward Island.....	13	6	7	0	2	4
Nova Scotia.....	53	22	31	38	16	22
New Brunswick.....	63	17	46	47	10	37
Quebec.....	421	172	249	293	95	198
Ontario.....	343	94	249	265	87	168
Manitoba.....	68	29	39	38	13	25
Saskatchewan.....	102	35	67	65	16	49
Alberta.....	64	30	34	55	15	37
British Columbia.....	54	16	38	30	12	18
Rate per 1,000 live births.						
Canada.....	5.0	1.8	3.3	4.9	1.6	3.3
Prince Edward Island.....	6.4	3.0	3.5	4.0	1.3	2.7
Nova Scotia.....	4.6	1.2	3.4	4.4	1.9	2.6
New Brunswick.....	5.8	1.6	4.3	6.1	1.3	4.8
Quebec.....	5.1	2.1	3.0	5.0	1.6	3.4
Ontario.....	5.1	1.4	3.7	5.4	2.0	3.4
Manitoba.....	4.8	2.1	2.8	3.7	1.3	2.4
Saskatchewan.....	4.9	1.7	3.2	4.2	1.0	3.2
Alberta.....	3.8	1.8	2.0	4.7	1.5	3.2
British Columbia.....	5.3	1.6	3.7	4.2	1.7	2.5

*Preliminary figures.

Again your Committee would draw attention to the problem of providing medical service to our Outpost Homes and that not only in the far west and the far north but in the older provinces where sparse settlement and difficulties deprive homes and families of medical care. Your Committee would ask the Association to bring this problem not only to the attention of the provincial medical associations, but to the attention of the Dominion Government and the Provincial Governments. It concerns them all. In the day of the aeroplane and the radio it should not be impossible to solve this problem.

Your Committee would recommend for study the following reports:—

1. A Five Year Survey of Maternal Mortality in Manitoba by Drs. Jackson, Defries and Sellers, *Can. Pub. Health Journal*, March, 1934.

2. Maternal Mortality in New York City, edited by Geo. W. Kosmak.

All of which is respectfully submitted.

W. B. HENDRY,

Chairman.

Approved.

The following points were brought out in the discussion of this report:—

"The recommendation made in this report is an extremely important one, that is, that the problem of medical service in outlying districts be brought to the attention of the Provincial Medical Associations, the Dominion Government, and the Provincial Governments. The Victorian Order of Nurses report that the maternal mortality rate with them is now 1.9, whereas, a year ago, it was 2.4. The reduction is due to the fact that a larger number of cases are treated in hospitals. If we could provide nursing and hospital care for every case of confinement there would be a vast reduction in maternal mortality rates. We would express the hope that very definite action be taken with regard to this report.

"In connection with Red Cross work in the Province of Ontario, we have a large number of outpost hospitals. In the past ten years we have conducted several thousands of confinement cases. Last year, the Red Cross nurses conducted 110 cases of confinement without a doctor being present and without one mortality. In each of these cases the mother was seen by the nurses several times before confinement. This is very important. We do not advocate the conduction of confinement cases without a doctor. These 110 cases mentioned were cases where no doctor could be obtained. Our work is carried on absolutely under the direction of a local physician where there is one who can be reached.

"Adequate medical supervision during the whole nine months of pregnancy is necessary. Much of the success in the outposts is due to teaching the public how to maintain health."

It was felt that a useful purpose would be served if in each of the Medical Societies throughout Canada a special day could be devoted to post-graduate lectures on the cause and prevention of maternal mortality, and the Post-graduate Committee was instructed to develop this idea.

REPORT OF THE COMMITTEE ON LEGISLATION

Mr. Chairman and Members of Council:—

Your Committee on Legislation has met on many occasions during the past year, and, during the present Session of the House of Commons, has had various interviews with the Minister of Health and his departmental officials. Our consultations were largely in regard to amendments to the Food and Drugs Act and the Proprietary or Patent Medicine Act. We have not succeeded in securing every amendment which we sought in connection with these Acts, but we have made several advance steps.

The following is the text of the Bill to amend the Food and Drugs Act:—

"His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. Subsection one of section three of the Food and Drugs Act, Chapter seventy-six of the Revised Statutes of Canada, 1927, is amended by adding thereto the following paragraph immediately after paragraph (h) thereof:—

"(i) adding to or removing from the list contained in Schedule A hereto such abnormal physical states, disorders, diseases, or symptoms of diseases, and adding to or removing from Schedule B hereto such material as may be deemed by the Minister to be necessary in the public interest."

2. The said Act is further amended by adding thereto the following section immediately after section six thereof:—

6A. No person shall import, offer for sale, or sell any remedy represented by label or by advertisement to the general public as a treatment for the diseases, disorders or abnormal physical states named or included in Schedule "A" to this Act, or in any amendment to such schedule.

EXPLANATORY NOTES

The main purpose of this amending Bill is to bring the Foods and Drugs Act and the Proprietary or Patent Medicine Act into conformity in regard to diseases for which remedies marketed under these Acts may not be sold. Under the Proprietary or Patent Medicine Act remedies are not permitted to be sold for the diseases mentioned in the proposed Schedule A appended; whereas, remedies for these diseases may be sold under the Food and Drugs Act. It is now proposed to apply Schedule A to the Food and Drugs Act, thereby bringing both Acts into conformity.

Schedule A:

Alcoholism, Appendicitis, Arteriosclerosis, Blood Poisoning, Bright's Disease, Cancer, Diabetes, Diphtheria, Dropsy, Epilepsy, Erysipelas, Gallstones, Kidney Stones, Bladder Stones, Gangrene, Gastric and Duodenal Ulcers, Goitre, Heart Diseases, High Blood Pressure, Infantile Paralysis, Influenza, Lockjaw.

3. The said Act is further amended by adding thereto the following section immediately after section eight thereof:—

"8A (1) Notwithstanding anything contained in the last preceding section, no person shall import, manufacture, sell or offer for sale any compound vinegar, vinegar mixture, imitation vinegar or substitute for vinegar.

(2) Any acetic acid found in the possession of a manufacturer of food products or on any of the premises occupied by him as such shall be deemed to be of a kind which might be employed for purposes of adulteration and may be seized by an inspector, and such manufacturer shall be liable upon summary conviction for a first offence to a fine not exceeding two hundred dollars and costs and not less than fifty dollars and costs or to imprisonment for any term not exceeding three months, or to both fine and imprisonment, and for each subsequent offence to a fine not exceeding five hundred dollars and costs and not less than one hundred dollars and costs or to imprisonment for any term not exceeding six months or to both fine and imprisonment, and the acetic acid in question shall be forfeited to His Majesty and may be disposed of as the Minister may direct."

The following is the text of the Bill to amend the Proprietary or Patent Medicine Act:—

"His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. Subsection one of section eight of the Proprietary or Patent Medicine Act, chapter one hundred and fifty-one of the Revised Statutes of Canada, 1927, is amended by adding the following paragraph immediately after paragraph (f) thereof:—

"(g) if it contains any drug which is included in the schedule to this Act and there is not printed in a conspicuous manner on the labels and wrappers the following warning:—
'This preparation contains a potent drug and should be kept in a place inaccessible to children.'"

EXPLANATORY NOTES

The purpose of this amendment is to induce parents or guardians to place patent medicines containing potent drugs which might prove injurious to children in a place inaccessible to them.

We have also had under discussion the evils resulting from the indiscriminate sale of barbituric preparations. We have arranged for conferences between this Committee, representatives of the Pharmaceutical Association and the departmental officials. I do not think it possible to have legislation provided during the present session of Parliament, but your Committee begs to report decided progress in the negotiations.

All of which is respectfully submitted.

G. D. STANLEY,
Chairman.

Approved.

REPORT OF THE COMMITTEE ON ROYAL COLLEGE OF SURGEONS OF ENGLAND

Mr. Chairman and Members of Council:—

Your Committee has nothing to report except to state that correspondence with certain officials of the Royal College of Surgeons of England and others interested in Great Britain, would indicate that further co-operation is desirable and likely to be attained in the future.

It may be stated that after Canada took the initiative in securing the consent of the Royal College of Surgeons to conduct the Primary examinations for the fellowship in Canada, Australia applied for and obtained similar privileges. One such examination has already been held in Australia and a second examination will be conducted this year in that country when a large number of candidates will present themselves for the primary fellowship.

All of which is respectfully submitted.

A. PRIMROSE,
Chairman.

Approved.

REPORT OF THE MEYERS MEMORIAL COMMITTEE

Mr. Chairman and Members of Council:—

In June 1932, the first award was made by the Meyers Memorial Committee when the prize of \$100 was given to Dr. A. McCausland of the Ontario Hospital, Mimico, for his thesis on "The Functional Neuroses."

The restriction of the topic for discussion and the comparatively small number of practitioners who take an interest in this limited field, make the likelihood of a large response very poor.

The only recommendation the Committee has to make is that the Association continue to give as wide publicity as possible to this bequest, first, through the columns of the *Journal*; second, by soliciting the co-operation of the Canadian National Committee for Mental Hygiene; and third, by circulating to the Mental Hospitals of Canada information as to the conditions governing the prize.

All of which is respectfully submitted.

J. T. FOTHERINGHAM,
Chairman.

Approved.

REPORT OF THE COMMITTEE ON EDUCATION

Mr. Chairman and Members of Council:—

The Committee recommends the adoption of a revision of the principles defining the objectives of medical education:—

I. The main purposes of the undergraduate medical course are to train the student so that on graduation he will have acquired the following:—

(a) *Character and Personality.*

The capability of thinking for himself, of continuing his self-education, of being ripened by experience, of being resourceful and showing initiative in investigation and research.

The attitude and inclination to approach problems from (1) a scientific point of view, *i.e.*, to practise the science of medicine; and (2) a humanitarian point of view, *i.e.*, to practise the art of medicine.

(b) *Qualifications.*

The possession of the medical knowledge that qualifies him to proceed to any one of the following:—

1. The general practice of medicine, either individualistic or organized, of the new type suited to the needs of modern society.
2. The conduct of scientific work in one of the medical sciences.
3. Post-graduate instruction in preparation for the field of Preventive Medicine.
4. Post-graduate instruction in preparation for the practice of one of the Specialties.

II. Graduate courses of instruction should be organized to provide for the training of men for the practice of the Specialties or for Preventive Medicine.

The determination of the qualifications of specialists to practise in a special field should be based on the fulfilment of certain minimum educational requirements and the passing of a specialist examination.

The possession of the necessary qualifications as a specialist should be recognized by a non-compulsory certificate or diploma, and by the publication of a register or list of those so qualified.

The supervision of the qualification and certification of specialists should be placed under a board or council, consisting of representatives of the medical practitioners, the medical associations, the medical licensing bodies and the universities.

All of which is respectfully submitted.

E. STANLEY RYERSON,
Chairman.

Approved.

INTERIM REPORT OF THE COMMITTEE ON GROUP HOSPITALIZATION

Mr. Chairman and Members of Council:—

"Group Hospitalization" or the "Prepayment Plan for Hospitalization" has arisen in an effort to ease the burden of hospital costs on the individual. During the last four years the movement has spread very rapidly over the entire United States and a number of Canadian centres have either adopted some plan or are considering doing so very shortly. In many respects these plans are similar to the long established pay deductions or checkoffs in mining and industrial areas, but are now being extended to groups at large or even individuals. Practically all do not include medical services, such being an individual arrangement. An outline of the essential features of the more carefully formulated plans is to be found in the booklet "Hospital Care in the Family Budget."

Much discussion has taken place as to whether or not group hospitalization is the best solution for the cost of hospital care. If so, some forms would seem much more desirable than others. What should be the attitude of the medical profession? What safeguards would seem necessary in the interests of (a) the public and (b) the medical profession?

As this endeavour to meet hospital costs is spreading rapidly and as there seems to be considerable misunderstanding on the subject, it would seem advisable that the medical profession in Canada endeavour to formulate a definite attitude towards this movement.

Your Committee which was appointed only a very short time ago and which is made up of members from various parts of Canada, has had no full meetings. The Toronto nucleus, however, has met twice, and a considerable amount of information on Group Hospitalization, has been collected and sent to the members of the Committee.

As this whole subject is almost entirely new to most members of the Canadian Medical Association, and because its development has become quite widespread in the United States with the probability of similar development in this country where at the present time only a very few Group Hospitalization plans are in operation, your Committee is of the opinion that the matter should be studied by this Committee for another year with the hope of bringing in a complete and useful report at that time.

The Toronto nucleus has agreed upon the following basis of study and report:—

1. Study and Review of Existing Plans of Group Hospitalization.
 - (a) American.
 - (b) Canadian.
 - (c) British.
2. Summarize advantages of general principle.
3. Summarize disadvantages and potential dangers of Group Hospitalization.
4. State recommendation of committee *re* principle of Group Hospitalization.
5. If favourable to Group Hospitalization, outline ideal form for Canadian situation:
 - (a) Basis of plan.
 - (b) Involvement or otherwise of medical profession.
 - (c) Extent of service provided.
 - (d) Financial basis.

All of which is respectfully submitted.

F. W. ROUTLEY,
Chairman

Approved.

REPORT OF THE COMMITTEE ON ECONOMICS

Mr. Chairman and Members of Council:—

The Committee on Economics begs to submit its report dealing with A PLAN FOR HEALTH INSURANCE IN CANADA, prepared in accordance with the instructions of the Executive Committee.

In order to present the report at this time, it was impossible to have all members of the Committee review it. Nevertheless, it can be stated that the report represents the views of the majority of the Committee, it having been possible to amend the preliminary draft to meet most of the suggestions made by members of the Committee.

MEMBERS OF THE COMMITTEE ON ECONOMICS

<i>British Columbia—</i>	J. H. MacDermot, Vancouver.
<i>Alberta—</i>	J. S. McEachern, Calgary. E. L. Pope, Edmonton.
<i>Saskatchewan—</i>	R. A. Dick, Canora. S. E. Moore, Regina.
<i>Manitoba—</i>	George Clingan, Virden. G. S. Fahmi, Winnipeg. E. S. Moorhead, Winnipeg. W. Harvey Smith, Winnipeg. G. F. Stephens, Winnipeg. D. A. Stewart, Ninette.
<i>Ontario—</i>	J. G. FitzGerald, Toronto. J. Heurner Mullin, Hamilton. Alexander Primrose, Toronto. G. A. Ramsay, London. G. H. Stobie, Belleville. Ward A. Woolner, Ayr. George S. Young, Toronto.
<i>Quebec—</i>	A. T. Bazin, Montreal. Grant Fleming, Montreal. L. Gérin-Lajoie, Montreal. Albert LeSage, Montreal. C. F. Martin, Montreal. F. G. Pedley, Montreal.
<i>New Brunswick—</i>	C. J. Véniot, Bathurst.
<i>Nova Scotia—</i>	H. G. Grant, Halifax.
<i>Prince Edward Island—</i>	W. J. P. MacMillan, Charlottetown.

A PLAN FOR HEALTH INSURANCE IN CANADA

INDEX TO REPORT

Introduction	26
I. Present Organization	26
II. The Problem	27
III. Health Insurance	28
IV. National Health Insurance in England	30
V. Highlands and Islands of Scotland Medical Service	31
VI. Union of South Africa	31
VII. German Sickness Insurance Scheme	31
VIII. French System of Health Insurance	32
IX. Trends in Health Insurance	32
X. The British Medical Association's Proposals for a General Medical Service for the Nation	32
XI. Medical Care for the American People	33
XII. Hospital Care Insurance	34
XIII. A Critical Analysis of Sickness Insurance—Preliminary Report by the Bureau of Medical Economics of the American Medical Association	34
XIV. What is an Adequate Medical Service?	36
XV. Consideration of Some Criticisms of Health Insurance	36
XVI. Discussion	38
XVII. General Statement, Canadian Situation	39
XVIII. Medical Care of the Indigents in Canada	41
XIX. Medical Care of the Middle-Class in Canada	44
XX. Workmen's Compensation	47
XXI. Provincial Action	47
XXII. Costs of Medical Care	52
XXIII. General Considerations of Plan	53
XXIV. Administration	54
XXV. Persons Included in Plan	56
XXVI. Benefits	56
XXVII. Contributions to the Insurance Fund	57
XXVIII. Costs	58
XXIX. Payment of Medical Practitioners	58
XXX. General Outline of Plan	59
XXXI. Enumeration of Principles	59
Bibliography	60

The plan by which medical service is provided is important to the extent that it enables all to enjoy medical care, the quality of which is assured by the medical profession practising under the plan.

INTRODUCTION

The Canadian Medical Association, as a body, represents the medical profession of Canada.

Article II. of the Association's Constitution and By-Laws enumerates the objects of the Association, which include:—

- (c) To promote the public health;
- (h) To assist in the advancement of medical legislation for the good of the public and the profession.

Under these objects, it would be fair to assume that the Association is committed to engage itself actively in the consideration of plans whereby the state of the public health may be improved, and to consider ways and means to secure any legislative action which is deemed necessary to raise the standards and increase the efficiency of medical practice, in the common interest of the medical profession and the public.

The Canadian Medical Association has not, as yet, expressed any intention of endorsing or pressing a scheme on the attention of any government. What is now proposed is a statement of what the Association considers to be essential principles in a scheme of health insurance in Canada, so that it may be recognized by those responsible for dealing with such subjects, as the considered view of the medical profession. What may be done later is for the Association to determine.

The Canadian Medical Association has had the subject of Health Insurance brought to its attention from time to time, during the past few years. In 1929, the *Journal* of the Association carried two excellent articles on Health Insurance by Dr. J. H. MacDermot.

At the Annual Meeting of the Association in 1929 the Committee on Economics reported that the British Columbia Legislature had appointed a committee to study health insurance. After discussion, the following resolution was passed by the Council of the Canadian Medical Association:—

"That we recommend to the Association that some one be appointed to make a careful study of the whole question of state medicine and report to the proper committee, which, in turn, will report to the next annual meeting."

The Executive Committee later secured copies of all available literature on the subject for the members of the Committee. A memorandum on Health Insurance was prepared at the request of the Executive Committee, and was presented, as an appendix to the report of the Committee on Public Health, at the 1930 annual meeting. At this meeting, growing out of the report of the Committee on Economics,

"it was duly moved, seconded and agreed that Council request the Committee on Economics to report to the Executive Committee, at an early date, with reference to the principles which the Committee finds are fundamental in the relationship of the profession to any system of health insurance."

Council, at the 1931 annual meeting, asked the Chairmen of the Committees on Public Health and Economics to submit names for the formation of a study group to consider the question of health insurance. This was done, and the study group reported to the 1932 annual meeting. At this time, the need for studies of the adequacy of medical care in Canada was stressed.

It was then decided to discontinue this study group and to place the responsibility for further activities along this line with the Committee on Economics. The Chair-

man of this Committee asked for more definite instructions, and, in response to his request, the Executive Committee, at a meeting held in Ottawa on November 29, 1932, passed the following resolution:—

"That the Committee on Economics be authorized to prepare a plan or plans for health insurance, and that these be passed to the various provincial associations for their consideration, criticism and suggestions."

The present report is prepared, therefore, in accordance with the resolution of the Executive Committee.

The necessity for, and advisability of such action may be judged by what has happened in other countries where the medical profession has usually been ignored when health insurance legislation was being drafted, partly because the organized medical profession was not prepared to give leadership or to speak on behalf of organized medicine, no plan having been adopted.

Even with the French health insurance legislation enacted recently it was not until after the Act was passed that the medical profession of France organized its members, raised the necessary funds, and carried on the publicity required to educate the public to the point of view of the profession. The result was that the law was amended so as to meet most of the demands of the profession.

In several provinces the medical profession has been requested by Royal Commissions to present the views of their members concerning health insurance. Obviously, if this is to be accomplished in a satisfactory manner, it requires a considerable period of time, and, therefore, if the medical profession desires to accept such opportunities, the views of the members should be determined without delay, and the profession be prepared to offer definite constructive proposals.

In this as in other matters, it is the body which has prepared a concrete proposal which may expect this proposal, with modifications, to be accepted and to provide the basic plan for the final scheme. The original basic plan is always difficult to change, hence its vital importance. For this reason alone, the medical profession of Canada should be prepared with such a plan, if they desire to direct the development of health insurance along the lines which to the members appear to be best. This is not a selfish motive, because what is best for the medical profession must be best for the public. Passive opposition gets nowhere.

I.—PRESENT ORGANIZATION

Medicine has developed along individualistic lines. The individual decides to enter upon the study of medicine, and, provided he can pass the qualifying examinations, he is, as a rule, accepted. Having followed his medical studies, he is licensed to practise upon having passed the required examinations. He then proceeds upon his own responsibility to select the location for his practice and the form it will take, whether general or specialized.

The choice of physician is made by the patient, who not only selects his physician but decides when the physician's services are required, or when he "is sick enough to have a doctor". Fees are arranged on a personal basis between physician and patient.

The State has some vested interest in the individual medical practitioner because the undergraduate medical student pays, through his fees, only about one-third of cost of his medical education. Public funds or privately-subscribed funds defray two-thirds of the cost of medical education.

Large sums of public moneys are invested in hospitals which provide the facilities required for the practice of medicine and the education of physicians and nurses.

Furthermore, the profession has had conferred upon it certain rights and privileges, which means that the State recognizes the profession as a social unit.

From the point of view of medical services, the population may be divided into the three following groups:—

1. The indigent, who are unable to pay and for whom some provision is usually made.
2. The well-to-do, who can secure such care as they require because they are able to pay for it.
3. The so-called middle-class, whose incomes vary greatly, but who, on the whole, are presumably able to provide themselves with the necessities of life, including medical care.

Medical Care of the Indigents.

The present system is a development of the practice of medicine under which the practitioner cared for all those who came to him and based his fees upon ability to pay.

In general, the care of the indigents in their own homes is left to the medical profession, although in some places, a physician is paid out of public funds to give such care. When hospital care is required, a per caput per diem allowance is usually paid to the institution caring for the patient, but no fee is paid to the physician, it being argued by some that the physician receives his reward through his hospital appointment.

The medical profession is proud of its record of gratuitous service to those who are in need. The members of the profession, in general, are willing to give a certain amount of free service. Nevertheless, there is a general feeling among them that the profession is being exploited, and that governments are meeting their responsibilities for the care of the indigent at the expense of the medical profession.

Free service should be entirely voluntary, such as when a physician continues his services to a family who have become unable to pay, or when he provides service beyond that for which his patients can pay. But to assume that the medical profession will contribute one of the necessities of life, for the provision of which the State is responsible, is unsound in every way. It is interesting to note that physicians are not allowed to deduct from their taxable incomes, under the heading of contributions to charity, a sum equal to their free service.

It is also true that, under the present system, the indigents must perforce accept what is offered. This state of affairs is not satisfactory either to the profession or to the indigent patient.

Medical Care of the Well-to-Do.

This group presents a problem because there is no fixed charge for the service purchased. The charge mounts according to the individual's ability to pay, and simply because these individuals have money they are expected to pay more than anyone else, and so compensate, in some measure, for those who pay less than the cost. For example, private-patient pavilions are, usually, a source of revenue. Those who use such accommodation pay more than the cost, the profits being applied to the deficits of the general wards. This is not a sound economic system. There is no reason why anyone should be overcharged simply because he can afford to pay such overcharge.

Medical Care of the Middle-Class.

The income for this group varies within a wide range. It is, of course, a question as to what are the lower and the upper limits of the group. Obviously, below a certain income families or individuals cannot afford to pay for anything more than food, shelter and clothing. An attempt is made by the medical profession to meet the needs of this group by a sliding scale of fees, adjusted to the presumed ability of the individual to pay. On the whole, this is not a satisfactory method of dealing with an economic problem. The sliding scale presumes that the physician is capable of accurately judging the ability to pay. It naturally tends to penalize the thrifty who, because of their thrift, appear to be and actually are more capable of paying. Those who pay assume at least part of the burden of those who will not or who are unwilling to pay, and who, in one way or another, avoid paying their bills.

Well-to-do patients are not evenly distributed among medical practitioners, so that the doctor who does the most free work may have none at all, or only a small share of the practice among the well-to-do.

According to the Committee on the Costs of Medical Care in the United States:—

"Approximately 50 per cent of all families of two or more members had, during 1928, total incomes of less than \$2,000, and 40 per cent more had incomes of \$2,000 to \$5,000."

Obviously, the capacity to pay, for the lowest income class of this group, is very limited. Ascending the scale, the capacity to meet ordinary medical expenses increases, but never does it become possible for the individual or family of the middle class to meet the costs of a severe or prolonged illness, particularly if hospital care is required, without real hardship and the depletion of savings.

It is unfortunate that, in most cases, when illness occurs, not only is there the added expense of the illness but there is, in addition, the suspension of wages. Indeed, when the bread-winner of the working-class family falls ill, the effect is devastating.

Sickness is not a personal matter in the sense that its effects are limited to the patient. If it is a case of communicable disease, it may spread to others. If there are dependents, then, temporarily or permanently, they are likely to become indigents. The vicious circle of poverty and disease is only too well known. In any event, there follow lost time, lost wages, and loss of productivity.

At first glance, it might be thought that the problem of costs might be met by reducing medical fees. This solution does not stand analysis because, in comparison with other professional incomes, the average medical income is not excessive. In 1929, the average net income of physicians in private practice in the United States was \$5,300. Care must be taken not to be deceived by averages. One-third had net incomes of less than \$2,500 and the median net income was \$3,800. The 70,000 general practitioners received less income than the 30,000 complete specialists.

It is in the public interest that physicians receive an income that is comparable to incomes in other professions. It is not that medicine is selected as a profession on account of the opportunities it offers for making a great deal of money, because there are few such opportunities, but rather that the prospective student has a right to expect a reasonable return for his services after he has qualified for practice.

There is no conflict between the wishes of the public and those of the profession. The public desire to secure a high standard of medical service, and so are willing to pay a reasonable fee for the service. The members of the profession are anxious to provide service and, in return, they expect a reasonable fee and satisfactory conditions under which to work. Failing such assurance, desirable students will not be attracted to medicine, and in the end, the public suffer from a lowered standard of medical service. It is because, as a whole, the public have confidence in the ability of the medical profession, and recognize the profession's devotion to human welfare that the majority of the public will accept leadership from the organized medical profession in devising ways and means of meeting the problems of medical care.

The medical profession occupies a strategic position in the development of any plan for medical services, because the profession have a monopoly of the knowledge concerning their field of service which is essential to the working of any such plan.

A peculiarity of medical service is that the purchaser buys something of which he has no appreciation as to the value, nor has he the capacity to judge as to the physician's ability. His selection of his doctor is usually based upon a personal liking, on popular opinion, or some such factor.

II—THE PROBLEM

How to make available for everyone the full benefits of curative and preventive medicine, irrespective of the ability of the individual to pay, and, at the same time, to secure the willing co-operation of the medical profession, is the problem.

In nearly all schemes, contributions are made by the employer, the employee and the State, the insured bearing the major part of the expense. The contribution usually varies with the basic wage. In England, it is a flat rate.

Benefits.

Cash—The cash benefit is usually a percentage of the basic wage. In England, it is a flat rate. There is usually a qualifying period, a waiting period (usually three days) and a time limit (usually twenty-six weeks). This means that the insured person is not eligible for a cash benefit until he has made a certain number of payments into the scheme, that cash benefits are not paid for the first few days of illness and are not continued beyond a certain period.

Medical—This benefit is provided in all schemes excepting in that of the Irish Free State. There is no qualifying or waiting period, but usually a time limit (sixteen to fifty-two weeks). Range of treatment varies from that of a general practitioner service in England to a complete service in Germany. The tendency is to extend the service given. Medicines, as ordered by the doctor, are usually provided.

Maternity—This benefit may be in the form of cash or of service, both with the idea of providing the mother with proper care. Cash benefits for stated periods, before and after confinement, are sometimes included.

Death—A cash benefit paid upon the death of the insured person, intended as a contribution towards burial expenses. It is either a fixed sum, or a proportion of the basic wage or income. This benefit is not paid in England.

The above benefits are called statutory benefits; they are received as a right by law. Further benefits, such as dental care, may be given in the nature of a bonus when the insurance funds permit of such additional expenditure.

It is usual to provide some extension of benefits during unemployment.

Payment of Physicians.

Physicians are paid under health insurance in any of the following ways:—

1. Fixed salary for whole or part-time service. This is best adapted to sparsely-populated areas, as in the Highlands and Islands of Scotland, where there is only one physician and, consequently, no question of freedom of choice of physician.
2. Capitation, or the payment of a per caput allowance per year for each insured person to the physician he selects. This system is used in England by choice of the medical profession.
3. Per case, or a set fee per case of illness, irrespective of the duration of the illness or the number of visits.
4. Per "medical act" or "payment for work done"; the money available to pay for medical care is divided in proportion to the number of individual visits made by each physician. The fee varies according to the type of service. This system is in general use in Germany.
5. Reimbursement; the insured person is paid out of the insurance fund, according to a fixed scale, and has available this money to pay, in whole or in part, the cost of his medical care, for which and for the amount of the fee he is to pay, he has arranged with any doctor of his choice. There is an official fee schedule which is not binding on the practitioner, but which is the basis of reimbursement by the insurance society. The physician merely certifies to having provided certain medical services. Sweden, Norway, France and Chile require the insured to pay a part of the cost of medical care.

Additional allowances may be provided for travelling and other expenses in rural areas.

Administration.

In those countries where voluntary schemes have been extensively developed, the tendency has been to continue the voluntary societies as insurance carriers. Otherwise, territorial organizations are set up.

The responsibility for the collection of the contribution rests upon the employer. Management may be by the State; the insured (English system in theory); the insured and employers (most systems); the insured, employers and the State. In only three countries (Japan, Bulgaria and Russia) are the funds taken charge of and distributed by the State. In other countries, this is done by the insurance societies or companies.

IV—NATIONAL HEALTH INSURANCE IN ENGLAND

It is not intended to attempt to describe this scheme in detail, but merely to point out the main provisions and anything that is peculiar to the English scheme. NATIONAL HEALTH INSURANCE, by G. F. McCleary, furnishes an excellent description of the scheme, and THE BRITISH SYSTEM OF SOCIAL INSURANCE, by Percy Cohen, gives the laws and regulations.

Previous to the adoption of health insurance, a large percentage of those who are now insured came under some form of contract or lodge medical service. There were private medical clubs, the physician employing a collector, to whom he paid a commission to collect the small weekly dues. There were also public medical clubs managed by a committee of doctors, the usual fee being one penny a week for adults. In addition, there were work clubs and Friendly Societies, providing medical service on a contract basis.

The National Insurance Bill was introduced and became law in 1911. The medical profession were opposed to the original bill's provision for medical service. The British Medical Association evolved what came to be known as the "Six Cardinal Points", for which the Association contended. These included an income limit for those eligible for medical benefit; free choice of doctor; administration of medical and maternity benefits to be independent of insurance societies; adequate medical representation on certain administrative bodies; reasonable remuneration.

The law is administered centrally by the Ministry of Health, and locally by the insurance society, with the exception of the medical benefit which is administered by the Insurance Committee on which there is medical representation. Fifty per cent of the membership of the sub-committee who investigate complaints against practitioners, excluding the chairman, are doctors. Insurance practitioners receive their remuneration from the Insurance Committee at a rate established by law; they do not have to bargain with the insurance society. The Local Medical Committee, made up of the medical practitioners of the area, are recognized by the Minister of Health as representing the medical profession.

The separation of cash and medical benefits to the extent which has been achieved in the English system likely accounts for the smoother working of that system. In addition, the medical profession discipline their own members, who are not subject to referees appointed by the insurance society.

In 1930, over 38 per cent of the total population were insured. The amount paid by males is 4½d. weekly, and by females, 4d.; the employer contributes an equal sum. There is no variation in contribution according to wages. Broadly, the scheme is compulsory for all workers below a certain income limit.

Sickness Benefit—15s. per week for men; 12s. unmarried women; 10s. married women. Commences on fourth day of illness and continues for 26 weeks.

Disablement Benefit—A continuation of sickness benefit after the twenty-sixth week. Men, 7½s. per week; unmarried women, 6s.; married women, 5s. No time limit; continues until individual is eligible for old-age pension at sixty-five years.

Maternity Benefit—40s. paid to insured women, or to wife of insured man, or 80s. if both are insured.

Additional Benefits—Insurance societies which have a surplus can give certain additional benefits such as dental and other medical care, or an increase in cash benefits.

Every physician has the legal right to have his name placed on the list or "panel" of doctors who are eligible to give medical care to insured persons. Every person has the right to select his own doctor. The doctor is not, however, obliged to accept every person who may select him. He cannot accept more than 2,500 insured persons.

The Act calls for "all proper and necessary services other than those involving the application of special skill and experience of a degree or kind which general practitioners, as a class, cannot reasonably be expected to possess. Attendance at confinement is not included."

The physicians were given the option of payment by capitation, attendance, or other system. All have now selected the capitation system. The capitation fee is 9 shillings.

A central mileage fund provides for the cost of transportation of rural practitioners.

Medicines are supplied on the prescription of insurance practitioners. Any qualified pharmacist is eligible. The control of prescribing is in the hands of the local medical committee.

The Ministry of Health appoints regional medical officers (81 in number) who act in several capacities, including that of medical referees in such questions as those which concern the inability of the insured person to work. Cases may be referred by either the medical practitioner or the insurance society. *The important point to note is that these medical referees are not appointed by or subject to the insurance society.* The effectiveness of this method is seen that, in one year, out of 529,903 cases referred for "incapacity references", 146,906 declared themselves as fit to work before the examination, and 117,017, in addition, did not attend for examination. *"The Regional Medical Staff is an element of great importance in the English Insurance Scheme."*

The attitude of the medical profession is expressed in THE PROPOSALS FOR A HEALTH SERVICE FOR THE NATION, by The British Medical Association, which advocate an extension of the present system.

The Royal Commission on National Health Insurance, 1926, reported:—

"We are convinced that National Health Insurance has now become a permanent feature of the social system of this country, and should be continued on its present compulsory and contributory basis."

V.—HIGHLANDS AND ISLANDS OF SCOTLAND MEDICAL SERVICE

The part of Scotland included under the term HIGHLANDS AND ISLANDS embraces one-half of the area of the country and 7 per cent of the population. It is very sparsely populated, with poor facilities for transportation. The bulk of the population are poor crofters (small farmers), and do not come under the health insurance act as employed persons.

For these reasons, it was impossible for doctors to secure a reasonable living, and the scattered population suffered from a lack of medical care. That the situation demanded special consideration was recognized by a grant of £42,000 per year, made in 1913 to improve the medical services in this area.

The agreement made with the medical practitioners was that they should visit their area systematically and give care to all persons. This means that the doctor cares for the indigent and insured persons, and, in addition, carries on private practice. He is paid from the insurance fund and a schedule of fees is agreed upon for private patients (5s. for the first visit, 3s. 6d. for subsequent visits). If this does not provide a reasonable income (£500 per annum after payment of rent and transportation), then he is guaranteed an additional sum to bring his total income up to a fixed amount.

Grants are made to defray the cost of transportation, a house may be provided, nursing service is arranged for, and the telephone and telegraph services have been extended to facilitate communication. Provision is made for an annual holiday.

One hundred and fifty-six physicians and one hundred and seventy-four nurses are engaged in this service. Newsholme, in discussing this scheme, concludes that "From the point of view of patients, there has been great public benefit. Even if benefit is sometimes abused, much suffering is assuaged, much illness is being curtailed, and lives are being saved, which, before the schemes of insurance and state aid were inaugurated, were being sacrificed." (This service is described in MEDICAL EDUCATION AND RELATED PROBLEMS IN EUROPE, Commission on Medical Education, April, 1930, page 132.)

VI.—UNION OF SOUTH AFRICA

In 1928, the Commission on Old Age Pensions and National Insurance of the Union of South Africa presented their report on Sickness Insurance. From their report, the following statements are quoted.

"There is no doubt in our minds that the main reason why countries situated outside Europe have not initiated schemes of Sickness Insurance to anything like the same extent as have the European countries is that the European countries are more densely populated, and that most of the overseas countries embrace large areas which are so sparsely populated as to render it difficult, if not impracticable, to apply an insurance scheme in these rural areas."

"In South Africa, for many years, a system prevailed whereby a medical practitioner was granted a small subsidy and the right to all the practice emanating from Government departments in the district, the object being to ensure that in the rural or sparsely populated areas there should be a medical practitioner. . . ."

"Of late years, the Health Department has been gradually changing the agreement from that of a subsidy to a salary basis. . . ."

"Under this authority, in some districts arrangements have been made by the Department of Health, whereby district surgeons travelling from their headquarters to out-stations and back are paid. . . for the time thus occupied." They receive fees for medical care of private patients.

"We are satisfied that the system governing district surgeons and the provisions in the law under which arrangements for periodical tours by them can be made are well suited to the needs for such sparsely-populated areas as the rural parts of South Africa. . . ."

"After considering all the information which we have been able to obtain, and studying the peculiar conditions existing in South Africa, we have come to the conclusion that it would be advisable and desirable to introduce a scheme to include workers in the industrial areas of South Africa, providing for sickness, medical, funeral, and maternity benefits."

"We recommend the introduction of a scheme of insurance against sickness applicable to workers in the industrial areas. . . ."

"We recommend that steps should be taken whereby the Health Department should extend the scope of the service by district surgeons and the provision of an increased number of tours. . . ."

VII.—GERMAN SICKNESS INSURANCE SCHEME

Germany was first in the field (1883), and now has the largest number of insured persons. Beginning with industrial wage-earners, the scheme has been gradually extended to include other groups, such as agricultural and domestic workers.

The contribution and benefits are not uniform, being left, within limitations, to the insurance societies. Con-

tributions are regulated in accordance with the basic wage, as is the sickness benefit.

Maternity and funeral benefits are provided. Disability insurance is provided for under a different law.

The medical benefit is a fairly complete medical service for the period of the cash benefit, or 26 weeks. In many places the Insurance Societies have their own institutions. More than half of all hospital cases are insurance cases, and part of the cost is usually paid out of insurance funds. An insured person pays a small fee for his permit to secure medical care for each illness.

The cost of prescriptions, up to a certain sum, is paid by the insured.

Physicians are paid on a capitation basis or for services rendered. The choice of physician is limited to those on the list. About seventy per cent of the profession are employed by the societies. Dispensaries are organized by the insurance societies in the large cities, to provide service.

Medical referees are appointed by the insurance societies, physicians being thus subject to control by the insurance society. All benefits are administered by the societies.

Certain administrative and judicial powers are exercised by the State, whereby it is made compulsory for everyone below a certain income level to be insured. No contribution is made by the State.

VIII.—FRENCH SYSTEM OF HEALTH INSURANCE

The law applies to industry, domestic service and to agriculture. The income limit is adjusted to the size of the family. The insured receives a cash benefit equal to half his wages for a period not exceeding six months, after which there is disability insurance. To those with a family to support, extra payments are made in case of illness.

The insured person and his dependents may go to any doctor, taking with them a form which authorizes them to consult a doctor. The condition most closely resembles that of private practice, as the insured is free to select any doctor and the doctor is not required to make reports of his diagnosis to the insurance societies. The fee is arranged between doctor and patient.

The insured person receives from the insurance society a fixed amount which reimburses him, in whole or in part, for his expenditure on medical care. This amount, it is expected, will be from seventy-five to eighty per cent of the cost, according to a scale of fees adopted by the society. The law contemplates that the societies and local medical associations will agree upon a schedule of fees. This agreement has not been secured in many places. In any case, the physician can charge what he considers to be a reasonable fee, which is a matter of private arrangement between him and his patient. This means that the insured pays direct from fifteen to twenty per cent of his medical costs.

This system has not been in operation long enough to permit of a fair judgment as to its value. *It does interpose a fee between doctor and patient.*

IX.—TRENDS IN HEALTH INSURANCE

A perusal of the changes in existing schemes and of the proposals made for new schemes indicates certain trends in health insurance which should receive consideration. These trends are:—

1. Extension of medical benefit to the families or dependents of the insured; first inaugurated in Hungary, 1907.
2. Expansion of medical benefit to include complete medical care.
3. The State, beginning with legislation and a contribution, is later called upon to settle disputes, with the result that the State tends to assume more of the administrative functions.
4. The disappearance of the various types of voluntary mutual-aid societies, which have acted as insurance societies, to be replaced by territorial

insurance organizations. In this way, all persons in one area would be brought under one administration.

5. Inclusion of those below a certain income level, whether or not they are employees.
6. Separation of cash and medical benefits.
7. Increasing power of the medical profession, through having a voice in the administration of the medical benefit.
8. Increasing recognition of the need for co-ordination with the public health services, and the fact that the preventive side of health insurance should be developed.

X.—THE BRITISH MEDICAL ASSOCIATION'S PROPOSALS FOR A GENERAL MEDICAL SERVICE FOR THE NATION

In the issue of March 4, 1933, of the *British Medical Journal*, there is printed an address by Sir Henry Brackenbury, Chairman of Council, of the British Medical Association, wherein he explains the method by which the Association formulates its opinions. This address is referred to because it is well to understand that these particular proposals, made in 1930, voice the opinion of the great majority of British practitioners. It should also be pointed out that the British Medical Association put forth these proposals as a basis of discussion, not with any idea of imposing them on the public.

The proposals are:—

1. A compulsory insurance scheme, including all those now insured and their dependents.
2. Inclusion of indigents with their dependents, if the authority responsible for the medical care of indigents enters into the necessary contract with the body responsible for insurance medical benefit.
3. The voluntary inclusion of certain classes with low incomes.
4. The medical benefit to be complete service based upon the provision of a family doctor service; consultant and specialist services to be secured through the family doctor.
5. "The Association would have preferred that the insurance against institutional risks should be through an extension of the National Health Insurance system for all insured persons and their dependents, but it has found the difficulties to be insuperable, as was the opinion of the Royal Commission on National Health Insurance of 1926, which reluctantly turned down proposals to this end, for the following reasons: first, the great cost; secondly, the impossibility of guaranteeing (as would be necessary if the benefit were made statutory and contributions compulsory) that accommodation would be forthcoming for all who required it; lastly, and most important, it would be inequitable to exact contributions from a large number of citizens if the benefits of the institutions were available (as they must necessarily be on medical and humanitarian grounds) for those who had not contributed. These objections still hold. The Association is strongly of the belief that insured persons and their dependents, as well as large numbers of uninsured persons of moderate means, can only get institutional treatment and pay for it, as most of them would desire to do, by some system of insurance, and as a national system is not available, advantage might be taken of a satisfactory hospital contributory scheme such as exists now in very many areas. Most of these would require radical alteration, because at present few make provision for payment for the medical treatment received. For a small weekly payment, the subscriber and his family may be insured against any claims which may come against them for the cost of institutional maintenance and treatment. There is no reason why there should not be such a scheme

in the area supplied by every hospital, council or voluntary. There need be no difficulty as regards persons who move from one area to another if there is a suitable scheme in each—that is, a scheme which provides payment for both maintenance and treatment.”

6. Hospitals, sanatoria, et cetera, to be provided by the local authority, supplementary to, but apart from the insurance scheme.
7. Public Health services to include:
 - (a) sanitary services;
 - (b) vaccination;
 - (c) medical inspection of children not above school age;
 - (d) educative and non-treatment centres;
 - (e) health education.
8. The administration to come under the Ministry of Health centrally, and locally, under a statutory committee, “Medical Services and Hospital Committee” on which the medical profession would have representation.

Briefly, what is recommended is that the present Health Insurance Act be extended to

- (a) Include dependents of insured persons;
- (b) Widen the scope of the medical benefit to include everything excepting institutional care;
- (c) Include indigents for medical benefit.

Considering their years of experience with Health Insurance, it is significant that the British medical profession now recommend an extension of the present Act. It would appear to be a fair conclusion that the experience of the medical profession has demonstrated that, with all its faults, it is the best plan available to provide an adequate medical service for the nation.

The exclusion of institutional care is a decision that is apparently regretfully made, because the principle of insurance for this is approved, but owing to the hospital situation as it exists, it is not deemed feasible. This is a warning which should be heeded in these considerations, namely, that the desirable may not be feasible or practicable.

Under the title *HEALTH INSURANCE IN ENGLAND*, there was published, in *The New England Journal of Medicine*, of April 12, 1934, an article by Sir Henry Brackenbury. The author of the article enumerates certain conditions growing out of British experience, which should be regarded as essential in health insurance service; these are:

1. Right of all doctors to be members of the service; absence of interference between doctor and patient; participation of the profession in the administration.
2. Separation of medical benefit from cash benefits.
3. Provision of a full medical service, including institutional care.
4. Administration on an area basis, not through “approved societies.”

XI.—MEDICAL CARE FOR THE AMERICAN PEOPLE

This publication, the final report of The Committee on the Costs of Medical Care, is worthy of the most serious consideration, because, in large measure, conditions in the United States are similar to those prevailing in Canada, and we should be able to learn a great deal from the five-year study of the problem of the costs of medical care as it existed in the United States.

The Committee consisted of forty-eight members, of whom twenty-four were physicians (thirteen private practitioners), three dentists, two nurses, six economists and sociologists, three non-medical public health workers, two social workers, and eight representatives of the general public.

As a result of their studies, the Committee made certain recommendations which may be viewed as plans.

Plan A—The majority report of the Committee (from which nine medical members dissented).

1. The Committee emphasizes the value of group organization for service, and recommends that, when possible, the medical professions, including physicians, dentists, nurses, pharmacists, and other associated personnel, be organized into groups, preferably around a hospital, for rendering complete home, office and hospital care, including both preventive and curative services.
2. The Committee recommends the extension of all basic public health services—whether provided by governmental or non-governmental agencies—so that they will be available to the entire population according to their needs. This extension requires primarily increased financial support for official health departments and full-time trained health officers whose tenure is dependent only upon professional and administrative competence.
3. The Committee recommends that the costs of medical care be placed on a group payment basis, through the use of insurance, through the use of taxation, or through the use of both these agencies. Cash benefits, if and when provided, should be separate and distinct from medical services.
4. The Committee recommends that the study, evaluation and co-ordination of medical service be considered important functions for every state and local community, that agencies be formed to exercise these functions, and that the co-ordination of rural with urban services receive special attention.
5. In the field of professional education, the Committee makes the following recommendations:—
 - (a) That the training of physicians give increasing emphasis to the teaching of health and the prevention of disease; that more effective efforts be made to provide trained health officers; that the social aspects of medical practice be given greater attention; that specialties be restricted to those specially qualified; and that post-graduate educational opportunities be increased.
 - (b) That dental students be given a broader educational background.
 - (c) That pharmaceutical education place more stress on the pharmacist's responsibilities and opportunities for public service.
 - (d) That nursing education be thoroughly remodelled to provide well-educated and well-qualified registered nurses.
 - (e) That less thoroughly trained but competent nursing aids or attendants be provided.
 - (f) That adequate training for nurse-midwives be provided.
 - (g) That opportunities be offered for the systematic training of hospital and clinic administrators.

It is to be noted that nine members of the majority group, two medical members of the largest minority group, and one other, subscribe to compulsory health insurance.

Plan B—Minority Report Number one.

This report, because it is signed by nine members, of which number eight are physicians, naturally attracts attention because it represents the critical attitude of a part of the medical profession.

The minority find themselves in agreement with the majority as regards public health services and professional education. The minority find themselves in disagreement with the majority on the point of “organization”. The minority, in referring to the Community Medical Centres for organized group practice, which is the fundamental recommendation of the majority, state:—

"There is nothing in experience to show that it is a workable scheme or that it would not contain evils of its own which would be worse than those it is supposed to alleviate."

and

"It seems to us an illustration of what is almost an obsession with many people, namely, that 'organization' can cure most, if not all, human ills."

also

"There is nothing in our own experience, nor have we been able to find anything in the Committee's studies to lead us to conclude that group practice can furnish better or cheaper medical care than we have at present."

Quoting further from the minority report:—

"The plans advocated in the majority report involving groups made up of general practitioners and specialists are theoretically attractive but thoroughly impractical. We are still far away from the time when the general practitioner will be accepted by a group of specialists as a correlator of their work."

"We wish to make it clear that the above discussion of group practice does not refer to the association of physicians upon the staffs of hospitals, nor their contact and consultation in clinics."

"Groups of specialists as distinctive organizations are very valuable for diagnosing or treating difficult or complicated cases, but for the 85 per cent of illnesses which make up the family doctor's practice better service can be given by the individual doctor in his own office than in a clinic, and at less cost."

In other words, the minority have no faith in organization as a solution of the problem, and question the value of group practice.

The minority (with two dissenting) express disapproval of Health Insurance, but say that if Health Insurance is to be adopted, the compulsory plan should be accepted, based on European experience.

The recommendations of the minority are:—

I.

The minority recommend that government competition in the practice of medicine be discontinued and that their activities be restricted (a) to the care of the indigent and of those patients with diseases which can be cared for only in governmental institutions; (b) to the promotion of public health; (c) to the support of the medical departments of the Army and Navy, Coast and Geodetic Survey, and other government services which cannot, because of their nature or location, be served by the general medical profession; and (d) to the care of veterans suffering from bona-fide service-connected disabilities and diseases, except in the case of tuberculosis and nervous and mental diseases.

II.

The minority recommend that government care of the indigent be expanded with the ultimate object of relieving the medical profession of this burden.

III.

The minority join with the Committee in recommending that the study, evaluation and co-ordination of medical service be considered important functions for every state and local community, that agencies be formed to exercise these functions, and that the co-ordination of rural with urban services receive special attention.

IV.

The minority recommend that united attempts be made to restore the general practitioner to the central place in medical practice.

V.

The minority recommend that the corporate practice of medicine, financed through intermediary

agencies, be vigorously and persistently opposed as being economically wasteful, inimical to a continued and sustained high quality of medical care, or unfair exploitation of the medical profession.

VI.

The minority recommend that methods be given careful trial which can rightly be fitted into our present institutions and agencies without interfering with the fundamentals of medical practice.

VII.

The minority recommend the development, by state or county medical societies, of plans for medical care.

The principles of any State or County Medical Society plan are:—

1. It must be under the control of the medical profession. (A "Grievance Board" to settle disputes, having lay representation, is permissible and desirable.)
2. It must guarantee not only nominal but actual free choice of physician.
3. It must include all, or a large majority of the members of the county medical society.
4. The funds must be administered on a non-profit basis.
5. It should provide for direct payment by the patient of a certain minimum amount, the common fund providing only that portion beyond the patient's means.
6. It should make adequate provision for community care of the indigent.
7. It must be entirely separate from any plan providing for cash benefits.
8. It must not require certification of disability by the physician treating the disease or injury.

XII.—HOSPITAL CARE INSURANCE

At the 1934 Annual Meeting of the American Hospital Association it was announced that in over thirty cities in twenty-one states, some form of hospital care insurance was in operation, and that most of these had come into being during the past year.

Hospital Care Insurance, or Group Hospitalization, is a plan whereby groups of employed persons or others make regular subscriptions into a fund which is used to pay the costs of hospital services for contributors or insured persons. The individual annual subscription, or premium, varies from five dollars to twelve dollars, according to the benefits provided and the costs in the area. It is usual to provide a maximum of from twenty-one to thirty days' care in a semi-private room.

The American Hospital Association has established as standards for group hospitalization:—

1. Emphasis on Public Welfare.
2. Limitation to hospital services.
3. Freedom of choice of hospital and physician.
4. Non-profit organization.
5. Economic soundness.
6. Dignified and ethical administration.

XIII.—A CRITICAL ANALYSIS OF SICKNESS INSURANCE

PRELIMINARY REPORT BY THE BUREAU OF MEDICAL ECONOMICS OF THE AMERICAN MEDICAL ASSOCIATION

Under the above title, the April, 1934, issue of the Association's Bulletin carried a thirty-page report from which the following is abstracted:—

"Humanitarian legislation and social insurance would relieve industrial poverty by substituting social responsibility for personal responsibility.

"Some of the very organizations that existed under feudalism still function in European systems of

insurance, although changed in almost everything but the common tradition. Such groups of fellow-workers had little to fear from malingering. Members constantly visited the sick and often assisted in their care. The societies were truly self-governing

"The supposition that these conditions could be carried over into the gigantic societies required for the insurance of millions is responsible for many of the evils of the present systems.

"In practically every nation, it (insurance societies) became a powerful political factor.

"These insurance institutions, originally formed for mutual financial relief, ultimately became the administrators of a national medical service

"The expenditures for medical service are still looked on, if one is to judge by insurance society expressions, as primarily for their original purpose of protecting the financial resources of the contributors. The physicians are always considered almost entirely as sources of expense

"When medical benefits come to occupy the most prominent place, these also become political issues, with harmful effects, not only politically but on the service itself. Here it is not so much a question of the amount of the benefits as their control and the forms of supplying them.

"Nearly every statement in regard to the working of sickness insurance is hotly disputed, but on no point is the evidence more conflicting than in regard to the character of the medical service.

"One result of following the industrial pattern was to exaggerate the importance of the administrative, managing function at the expense of the actual medical function.

"In the more recent systems of Great Britain and France, the medical profession succeeded in prohibiting the carriers from entering into the business of building and conducting medical institutions, so that most of the evils proceeding directly from lay management of medical practice institutions have not arisen in these countries.

"The greed to get 'something back' encourages a flood of patients with such minor illnesses as to have no real need of medical service prevents any adequate attention and proper treatment of those to whom medical service is of most vital importance and value.

"While this increase in 'morbidity rates' under insurance is closely related to the desire to obtain cash benefits, yet this is by no means the only cause is due to the excessive demand of the insured for unnecessary service.

"The most severe criticism of medical service under insurance is not based on the occasional examples of overworked practitioners, with resulting hasty careless diagnosis and treatment, but rather on the atmosphere of suspicion and antagonism, which destroys the very foundation of good service. Payment into a general fund over which the insured has no control (and from which he can get back his money, to which, rightly or wrongly, he believes he is entitled) only by being sick, creates the conditions described.

"It is not true that these conditions prevail to the same extent in all systems of insurance. They are much less evident in the English, French and Scandinavian systems, in which the control of medical practice remains largely in the hands of professional associations. They arise largely because of the combination of cash and service benefits in the same system, and even more from this domination of a 'third party', the insurance carrier, as administrator of the scheme. These conditions are also partly due to the fact that in nearly all insurance schemes, the individual contributor is relieved of all immediate personal financial responsibility.

"All phases of this conflict, which rages in nearly every country, between physicians and carriers, are but different aspects of the question of lay control of medical practice which is inherent in the form of organization and evolution of sickness insurance.

"A fundamental issue in this struggle for professional status is the question of the free choice of physician by the patient.

" it is just this personal relation between patient and practitioner that is the essential ingredient of good medical service.

"In the more recent systems—France, Great Britain and the Scandinavian countries—the physicians seem to be winning on this issue.

" the British and the French systems are almost the only ones in which every physician, unless disqualified by his own actions, is free to enter insurance practice and to be freely chosen by the insured.

"The method and the amount of the payment to physicians is always a point of sharp controversy. In the British and French systems, the societies have nothing to say about the form or amount of such payments.

"The costs of medical care under all systems of insurance are steadily increasing.

"The medical profession of all countries are unanimous in declaring that the system of supplying service through institutions with salaried physicians is destructive of the best features of service and degrading to the profession.

"Chronic and difficult cases, requiring much work, are certified to institutions, thus relieving the physician. The result has been an overloading of the hospitals in every country using this system (lump-sum payment to physicians).

"When the system of payment by the medical act is introduced, there is ample proof that the charges of excessive practice, brought by the societies, are largely justified.

"It is practically impossible from any available data to give any certain answer to the question of whether insurance has any inherent tendency to increase or decrease the annual income of the average physician.

"The societies always seek to control the admission of physicians to insurance practice.

"We are here very close to the heart of the most puzzling question in the whole problem of sickness insurance: whether it is possible to provide medical service out of a large impersonal fund, created by a multitude of contributors, without compelling the physician to accept the dual and mutually destructive functions of detective and medical attendant.

"Again, it is significant that in France, Great Britain and Denmark, where the societies have been defeated in their efforts to maintain a secondary control (of practising physicians) the system works far more smoothly than in Germany.

"It may be set down as an invariable rule, so far as experience up to the present time is a guide, that the quality of service, and the general satisfaction not only of the physicians but also of the patients, and, ultimately, even the societies, increases in almost direct ratio with the extent to which all phases of medical practice are controlled by professional associations without lay interference.

"No system has been able entirely to avoid restriction on prescribing.

"In a few systems, the patient pays the whole or part of the cost of drugs and medical supplies. While this at once does away with most of the evils of over-medication, the societies always fight any such provisions.

"There seems to be fairly general agreement, even among the sharpest critics of the system, that it offers some improvement in regard to certain pre-insurance conditions.

"The distinguishing character of the two generally satisfactory systems—British and Danish—is that these are the only ones of long standing in which there is the *least* lay control of medical service, and where the professional associations play a dominating part.

"The demand of the medical associations that the insured be individually required to meet some share of the medical expense at the time it is incurred is receiving such wide support that, in spite of the opposition of the societies, it has a good prospect of adoption into several of the older systems, and will probably be incorporated into any that may be established in the future."

XIV.—WHAT IS AN ADEQUATE MEDICAL SERVICE?

Before considering how a service might be provided, it is well to lay down what kind of service is required. Obviously, if a medical service is to meet the needs for medical care, it must be adequate.

When the British Medical Association issued their PROPOSALS FOR A GENERAL MEDICAL SERVICE FOR THE NATION, they enumerated, under "Services Required", the following items—

1. That a satisfactory system of medical service must be directed toward the prevention of disease, no less than to the relief of individual sufferers.
2. That the medical service of the community must be based on the provision, for every individual of a general practitioner or family doctor.
3. That a consultant service and all necessary specialist and auxiliary forms of diagnosis and treatment should be available for the individual patient, normally through the agency of the family doctor.
4. That the interposition of any third party between the doctor and the patient, so far as actual medical attendance is concerned, shall be as limited as possible.
5. That, as regards the control of the purely professional side of the service, the guaranteeing of the quality of service, and the discipline of the doctors taking part in it, as much responsibility as possible shall be placed on the organized medical profession.
6. That, in any arrangement for communal or subsidized or insurance medical service, the organized medical profession should be freely consulted, from the outset, on all professional matters, by those responsible for the financial and administrative control of that service.
7. That medical benefits of the present National Health Insurance Acts should be extended so as to include the dependents of all persons insured thereunder and entitled to medical benefit.
8. That every effort should be made to provide medical and nursing service facilities in institutions (Home Hospitals) where the family doctor may treat those of his own patients who need such provision and who thus remain under his care.

MEDICAL CARE FOR THE AMERICAN PEOPLE, Chapter II, is titled, THE ESSENTIALS OF A SATISFACTORY MEDICAL PROGRAM. "The Six Essentials" are given as:—

1. Safeguarding Quality of Medical Service and Personal Relation.

No plan is economically sound which does not safeguard quality, since efficient service is, in the long run, the most economical . . . The preservation of a personal relation between patient and physician is an essential element in safeguarding the quality of medical practice.

2. Provision for Meeting the People's Real Needs.

The amount of care which people need is far greater than that which they are aware of needing, and greater than that for which they are able to pay under present conditions.

3. Provision of Service on Acceptable Terms.

If adequate services are available but can be obtained only on financial terms which a large number of persons cannot or will not meet, the problem is not solved . . . The cost of care for those who cannot pay should be distributed, according to ability to pay, over the rest of the community.

4. Emphasis on Prevention.

Medical service should include systematic and intensive use of preventive measures in private practice and in public health work . . . Preventive service to patients, and instruction and guidance in the basic principles of personal hygiene should form an increasing part of the work of the individual physician.

5. Selection of Competent Practitioners.

Since medical science is a "commodity", the value of which the patient cannot correctly judge, it is important that he be assisted in the selection of practitioners and facilities.

6. Adequate Payment to Practitioners and Agencies.

A major essential of a satisfactory medical service is the provision of adequate compensation to physicians, dentists, nurses and other scientific practitioners, and adequate support to hospitals and other agencies.

XV.—CONSIDERATION OF SOME CRITICISMS OF HEALTH INSURANCE

The criticisms of health insurance are many, and here an attempt will be made to consider those which are most worthy of attention.

1. Health Insurance does not prevent sickness. It is pointed out that, under every scheme, the amount of sickness increases if one is to judge by the number of cases treated and the amounts paid out in cash benefits. To what extent this represents an increase in sickness or is due to more cases receiving the treatment required cannot be stated.

We know that when a health service is inaugurated in an industry, there is generally an increase in the amount of sickness reported. This does not mean an actual increase in sickness, but rather that sickness, which had not previously been recognized, is being discovered and treated. Early treatment is to be encouraged. It is fair to say that no health insurance scheme has been developed from the preventive side to any appreciable extent. It would seem reasonable that just as life insurance requires a medical examination of the applicant, so health insurance should require and provide for periodic health examinations of the insured. This would make the service truly preventive in its outlook.

The adequate treatment of the patient frequently implies social treatment as well as medical, and this broader outlook should be part of health insurance practice.

2. Health Insurance is incompatible with the spirit of individual freedom. This argument presumes that the present system is compatible. The opposite opinion has been expressed, namely, that the regular weekly contribution encourages thrift and gives the insured the right to a service, rather than causing him to accept charity or reduced fees. The university student whose fees only pay a part of the costs of his education, does not feel that he is accepting charity, nor does the

poor man's child feel inferior in the public school system although his father's taxes may be much below the cost of his education and that of what others pay.

3. Attitude of getting something out of it. Instances are quoted of an attitude that the insured, having contributed something, feel they should receive something, particularly with regard to cash benefits. It does seem reasonable that some reward in the form of a bonus or reduced payment should be given to those who do not draw upon the funds. It is also suggested that no cash benefit should count Sundays as a day for which such benefits are paid.
 4. Health Insurance lessens interest in public health. The desire for security is a normal human urge. Having secured economic security against illness, there is the danger that there will be less interest in the prevention of disease. It appears that the latter hazard is less formidable than the former. We see no slackening of public health preventive services in Britain under Health Insurance.
 5. Medical Certification. The issuing of certificates, by the physician, upon which the insured receives cash benefits, is the cause of more controversy than any other single point. This is so true that a complete divorcing of the two is commonly advised. It is to be remembered that unemployment insurance is gaining ground. It is unlikely that the State will arrange for a payment to unemployed on the basis of no work and leave out those who are unemployed because of illness. Furthermore, if the insured desire this cash benefit and are willing to pay for it to ensure against the loss of wages during illness, they are not going to give it up on account of some difficulty with regard to medical certification. To suggest that a separate staff of physicians should be employed to visit all who are ill, in order to certify to their inability to work, seems to be an unnecessary expense and duplication. Who is better fitted to pass such an opinion than the physician who is treating the case? Obviously, there are difficulties and there are abuses, but that does not imply that the general body of the medical profession are not to be trusted to express an honest opinion as to the patient's ability to work. The British Royal Commission (1926) stated that in their opinion "the ultimate will lie, we think, in the direction of divorcing the medical service entirely from the insurance system and recognizing it, along with all the other public health activities as a service to be supported from the general public funds." The minority report, "The evidence which we, in common with them, have heard, convinces us that it is undesirable to retain Approved Societies any longer as the agencies through which benefits paid in cash are distributed to insured persons." The minority evidently believed that much of the certification difficulty was due to the insurance societies.
- The medical profession are commonly blamed for over-prescribing and for being too free with incapability certificates. It is to be remembered that the insurance societies would naturally consider the payments to physicians as being excessive, and would criticize the actions of the profession which increase the societies' expenditures, because it is really the doctors who control the expenditures through prescribing and certification. The societies want cheap medical services.
6. The use of voluntary societies as insurance societies is generally condemned. Newsholme states: "It would conduce immensely to the efficiency of the British Scheme if a national society could be formed with local branches in each county and county borough; much of the present inordinate

bookkeeping would be avoided, the number of paid officials could be reduced, and it would become possible to utilize the national and local experience of sickness as a means of detection of excessive sickness, with a view to remedial measures."

The Minority Report of the British Royal Commission found:—

- (6) That the Approved Society system is a hindrance to the development of a complete public health policy.
- (8) That local authorities could and should take the place of Approved Societies as the bodies through whom sickness and disablement benefits should be administered.

It does not appear that this condemnation should extend to the use of regular insurance companies as insurance carriers, provided they would act on a non-profit or mutual basis, as arrangements could be made for a territorial set-up, eliminating competition and providing territorial statistical information.

7. Excessive administration of drugs is said to be an evil associated with any form of organized medical service, including health insurance. The profession are, perhaps, responsible for building up the faith of the public in a bottle of medicine. There is much to be said in favour of requiring the insured to pay direct some part of the cost of medicines in order to lessen this evil. Nevertheless, we should remember that the object of health insurance is to remove the barriers of securing the treatment required promptly, and no one should be deprived of medicines which he requires because of the barrier of having to pay part of the cost.
8. Sickness risks do not lend themselves to actuarial calculations, therefore it is impossible to apply the insurance principle to sickness insurance; consequently, the State must assume responsibility for the economic soundness of the scheme. If the purpose of health insurance is desirable, it would appear that we must learn how to overcome difficulties in carrying out the scheme. We do know that neither disease nor treatment can be standardized, and that, in itself, makes for difficulties in estimating duration of illness, et cetera. This is very annoying to the administrator, but is inevitable in the practice of medicine, which is the individual care of a sick person and, as such, is not subject to control on a mass basis.
9. Health Insurance alters the relationship between doctor and patient. Proper medical relationships are built upon respect and confidence. There is no doubt that hospitals and specialism have altered the relationship, but it does not follow that the change is undesirable. As long as respect and confidence are maintained, we need not fear changes in the relationship between doctor and patient. Unless the patient has faith in his doctor there is a loss which no amount of organization or mass methods can replace in any sense.
10. Health Insurance destroys initiative and progress of the medical practitioner. This criticism is commonly made by doctors who seem to believe that, if a doctor's income is assured through salary or in some other way, there follows a lack of interest and spur to work which is present under individual competitive practice. Such an attitude ignores the contributions made by the permanent army and navy medical corps, the work of university personnel, who are often on salary, and the activities of salaried public health officials. It would perhaps be more fair to say that the good man works well provided his conditions of work are reasonably satisfactory, without regard to the manner in which he is remunerated.

XVI.—DISCUSSION

1. An organized attack upon disease should begin with an adequate and scientifically directed attack upon the sources of disease and upon those conditions which, in general, favour the occurrence of disease. In saying this, it is recognized that we are still ignorant as to the causation of certain diseases which, as a consequence, we are unable to prevent; nevertheless, we are not making full use of the knowledge which we do possess as evidenced by the number of cases of preventable disease which continue to occur. This justifies the contention that every part of the country should be served by an adequate health department.
2. When considering the provision of medical services so as to ensure that the public may secure the medical service needed, it is important to give first consideration to assisting the people in their greatest need. If it is true that the greatest problem arises out of the costs of severe and prolonged illnesses which require consultant, hospital and other services, then it would appear logical to consider this problem first. If, however, the greatest need is for a family-doctor-service for everyone, that should receive first consideration.
3. When sickness does occur, more care than can be given by the family physician is required in certain cases. It may be argued that any scheme for medical care should be so complete as to meet all the needs of the patient, and that it is preferable to do this for a limited number rather than give partial care to a greater number. The converse is that some care is better than none, and our guiding principle should be the greatest good for the greatest number. A desire on the part of the people for a complete service is shown by the willingness of the public in England to insure voluntarily for the provision of hospital care.
4. The family physician is the most important unit in medical care. It is stated that he can give adequate care to over 80 per cent of those who become ill. There does not appear to be any real reason to force the family physicians into organized groups. It would appear that this will take place naturally if it is desirable. On the other hand, it does appear that the organization of consultants, specialists and institutions would facilitate the provision of their services, and would minimize the costs of their services. It is to be recognized that the development of specialists has fundamentally changed the relation of the family to their family physician. In the larger centres, families have a group of specialists rather than a family physician.
5. If we admit that there is a large group of wage-earners who are self-supporting in the ordinary sense of the word, but who cannot pay directly for the medical care they need, then the question is as to how medical care is to be secured, and the answer apparently is, by public moneys (taxes), or by insurance, or by a combination of the two. In all countries under health insurance, tax funds are used to supplement the money contributed through insurance. Taxation is a form of insurance, presumably based upon ability to pay, to provide each and every citizen with some service, such as education, or to make available some service in the common interest, such as a communicable disease hospital.
6. Experience would indicate that medical services in their medical aspects should be under the control of the medical profession. The business part of any such organized services will naturally be controlled by those who pay for the service. That is, the contributors, or the State representing the contributors should direct the business side of health insurance, while the medical profession should control the purely professional side of the service. The most important point is that no non-medical person should intervene between patient and doctor.
7. The class whose income is just above the income limit for Health Insurance will have difficulty in meeting the costs of prolonged or serious illness. Consideration might be extended to this group in providing against such conditions.
8. The most desirable health insurance scheme would be one that provides a complete medical service for all who are unable to provide such a service for themselves. In practice, it may be better to develop such a service gradually. Those who build in haste are forever changing. If, however, public funds are to be used, it is not to be expected that those of the same economic group would approve of the use of public funds to subsidize medical services for others in the same economic group. This would mean that the scheme, from its inception, would have to include all those below a certain income level, provided public moneys are to be used. The service does not need to be strictly uniform, indeed it is obvious that it must be adapted to the locality, as has been done, for example, for the Highlands and Islands of Scotland. There is no reason why the same system of payment to physicians should be enforced throughout; the choice of system for payment in any area, might very well be left to the physicians of the area to determine by majority vote.
9. Any adequate scheme of medical service implies that specialists shall be included. This calls attention to the need for some adequate provision for the designation of specialists. It further presumes that patients will be referred, and that specialists will act only as consultants or therapeutic agents and not receive patients direct. It also brings forward for consideration the advisability of exercising some reasonable control over the numbers admitted to the study of medicine. There is nothing desirable in having an excess over the real needs of the country of qualified medical practitioners. It is a waste of public and private moneys, and of human endeavour.
10. Medical Certification brings up the question of how to define "incapacity for work". The suggestion made is that incapacity for work means a condition in which an attempt to work would be injurious, and that work refers to the ordinary occupation. Obviously, the insured person cannot be expected, unless his disability is permanent, to change his usual occupation.
11. Indigents must be provided for; as to this, there is general agreement. The cost of such care must be borne by the State if private charity does not assume the burden. It is unreasonable to expect the medical profession to give such care beyond the point, at least, to which the members of the profession willingly and voluntarily go. Consideration should be given as to whether it is advisable to have a separate system for the indigent, or whether it would be preferable to include this group under health insurance for medical benefits, the State paying the premiums. There are many arguments for one medical service rather than two, and as to the indigents receiving a service that is no better and no worse than that given the insured. In any case, physicians who care for the indigent should be remunerated.
12. The most serious ill result which could grow out of health insurance would be its being considered as a "cure-all". At best, it is but part of what should be evolved—a complete medical service which will secure the fullest application of preventive and curative medicine. There is grave danger in overselling all forms of social insurance as panaceas for the ills of mankind.

PART TWO

SITUATION IN CANADA

XVII.—GENERAL STATEMENT

An outline of what has occurred in the field of Health Insurance in other countries has been presented (Part One) as a basis for the consideration of conditions in Canada.

Part Two of the report is devoted to a presentation of the Canadian situation, beginning with a general statement, and then passing to a more detailed consideration of what appear to be the most important or unusual conditions in Canada.

A review of Canadian vital statistics shows a number of deaths from typhoid fever—evidence of failure to apply sanitary knowledge; several hundreds of deaths from diphtheria—a preventable disease; thousands of infant deaths from diarrhoea and enteritis—demonstrating our neglect to teach mothers proper care of their babies and our failure to provide a safe milk supply. That medical care is not secured promptly is reflected in a steady increase in deaths from appendicitis and the fact that cancer cases usually come too late for treatment. While health supervision of young children is generally accepted and practised, the number of adults who avail themselves of their family doctor's services for the maintenance of health through periodic health examinations is still small.

1. Practice of Medicine.

In Canada, as elsewhere, the practice of medicine has developed along individualistic lines. The individual decides to study medicine, later selects the field of medicine in which he will practise and his location for practice. Medical education, and the licensing and discipline of medical practitioners are controlled by the provinces. No control of fitness for practice exists beyond the test of examinations, and no province has exercised any control over the number of practitioners licensed. The license is for the lifetime of the practitioner, provided he does not transgress the law under which circumstances, his license may be cancelled.

The College of Physicians and Surgeons of each province is the legally-constituted body, under provincial law, to control the practice of medicine. The governing body of the College of Physicians and Surgeons, is elected by the already licensed practitioners of medicine in the province concerned. The Medical Council of Canada has authority only to conduct examinations, which may or may not be recognized by the provincial Colleges of Physicians and Surgeons. At the present time, the examinations of the Medical Council of Canada are recognized in all provinces; it is hoped, by most of the provinces, that in a short time it will be possible to do away with examinations by the provincial Colleges of Physicians and Surgeons, and to require that candidates for licensure take the examinations of the Medical Council of Canada.

Alberta is the only province which has provided legal machinery for the designation of specialists. For one reason or another, this has not been used to any extent. Under any system of medical practice, it is desirable to provide for the proper designation of specialists, and if the system be some form of organized medical service, such designation becomes imperative. The advantages of uniformity are obvious. The recently created Royal College of Physicians and Surgeons of Canada provides for this. As a new organization, the Royal College has certain weaknesses, but from now on, all new Fellows will be admitted only by examination, so that, in the course of a comparatively few years, fellowship therein will designate the qualification of specialist in the Fellow.

2. Medical Care of the Indigent.

There are in Canada, at all times, a number of individuals classed as indigents, who are unable to pay for medical care, and who are, in general, largely cared for at the expense of the medical profession.

3. Medical Care of the Middle-Class.

A large percentage of the population are unable to meet the economic demands of illness because of low incomes and also because of the uncertainty of disease in relation to its occurrence and severity. In an endeavour to meet this situation, a sliding scale of fees is used, based upon capacity to pay rather than upon the value of the service rendered.

4. Medical Care of the Well-To-Do.

The number of individuals who can meet the costs of a severe or a prolonged illness without economic effort is comparatively small. These, as a rule, demand more care than is actually required, and they are, in general, expected to pay fees at the top of the scale, which does something to balance the free work. In practice, the well-to-do patients are not evenly distributed among medical practitioners, so that the doctor who does the most free work may have none at all or only a small share of the practice among the well-to-do, whereas another may have a large practice among this group.

5. Organized Medical Services.

Despite the fact that the private practice of medicine has continued in much the same manner for years, nevertheless, a number of changes have taken place in Canada, with the result that, at present, organized medical services, under private or governmental control, are more widespread than is generally recognized.

- (a) *Care of Mental Disorders*—The care of those suffering from mental disorders requiring institutional facilities has been accepted as a direct responsibility by provincial governments. With the exception of those in the Province of Quebec and a few private hospitals, mental hospitals, in Canada, are owned and operated by the various provinces. The Province of Quebec discharges its obligation by making grants to privately-owned and operated institutions. In most of the provinces, this field of service is being extended through the provision of mental hygiene clinics. This major branch of medicine is already established as an organized service under governmental control—actually, state medicine.
- (b) *Workmen's Compensation*—The care of the injured workman, at the expense of the employer, through a form of insurance, is provided for in all provinces excepting Prince Edward Island. The fees for the medical care of the injured workman are fixed by a commission, which commission also exercise some measure of control over the medical care given. This arrangement overrules the old right of the physician to arrange his fee with his patient.
- (c) *Industrial Health Services*—A number of industries have provided health services for their employees, realizing that the health of the employee is a matter of concern and importance to the employer. The employer is interested in the rapid and complete recovery from illness of his employee, and is also concerned with the prevention of illness and the maintenance of fitness of those who work for him. There is no record available of the number of such services in Canada, or of the type of service.
- (d) *Medical Care by the Dominion Government*—The Dominion Government provides for the medical care of a large number of war veterans (pensioners). In the fiscal year, 1931-32, there were 11,116 cases admitted to hospital. On March 31, 1932, there were, in the eight hospitals of the Department of Pensions and National Health, 1,676 patients, of whom 889 were "general" 717 "mental" and 70 "t.b."

The Dominion Government provides care for Sick Mariners. Under provisions of Part V of the Canada Shipping Act, dues are collected from vessels using Canadian ports. These dues make a trust fund (Sick Mariners Fund) administered by the Department of Pensions and National

Health for the care of sick mariners. The usual procedure is to arrange with local hospitals to provide whatever care is required. Expenditure for the fiscal year, 1931-32, was \$208,845.90 for the care of 5,816 sick or injured mariners.

The care of lepers, in two lazzaretti (one on the Atlantic Coast and the other on the Pacific), is assumed by the Dominion Government. The Indians on the reservations, as wards of the Government, are provided with medical care.

- (e) *Public Health Services*—The field of Public Health has gradually developed. The treatment of communicable disease has been recognized, for many years, as being part of the program for the control of communicable disease. Responsibility for isolation hospital care is usually assumed, in the larger centres of population, by the local department of public health. Diagnostic and treatment clinics for venereal disease and tuberculosis are an accepted part of public health services. A wider vision as to the prevention of diseases other than communicable disease, and an appreciation that early diagnosis and early adequate treatment are essentially preventive in their results, have brought public health activities into what has been considered the field of curative medicine. Some governments are providing facilities for the diagnosis and treatment of cancer. Public health laboratories have, in some places, added service in tissue diagnosis and blood chemistry. Public opinion is forcing governments to take action, but, up to the present, practically the only action governments have seen fit to take is an extension of their public health services, usually on a clinic basis. Public health organizations, official and voluntary, are providing health supervision for expectant mothers, infants, pre-school and school children. These services are for the presumably healthy, and treatment is not prescribed for those who are found to be in need of medical care, such cases being referred to the family physician.

- (f) *Medical Care by Individual and Group Insurance*—The problem of meeting the costs of medical care has been dealt with in two ways by group action:—

- (1) Those who, on their own initiative, enter into a contract with an insurance company to receive economic protection against sickness or accident, or both.

The Department of Insurance, Canada, states:

"The Department has no information as to the number of accident and sickness insurance policies in force as at December 31, 1932, but the net premium received for these classes of insurance by Dominion licensees amounted to, for personal accident insurance, \$2,917,637; for sickness insurance,

\$1,454,949; and for combined accident and sickness insurance, \$1,636,395."

From these figures, we learn that the sum of \$6,008,526 was paid in premiums, during 1932, for personal insurance against accident and sickness.

- (2) Fraternal and other similar organizations, as a part of their service to members, have provided medical care. The lodge type of medical service has been generally condemned because it tends toward a poor type of service growing out of bargaining. It removes from the individual freedom of choice of physician. The Department of Insurance, Canada, gives the following information:—

1. *Canadian Fraternal Benefit Societies* (Abstract of Sickness, Funeral and Accident Insurance, 1932).

Number of certificates in force (in Canada)..... 59,863
Premiums paid..... \$355,474.00
Benefits paid—Sickness..... 407,111.00
Funeral..... 24,892.00

2. *Foreign Fraternal Benefit Societies* (Abstract of Sickness, Funeral and Accident Insurance, 1932).

Number of certificates in force (in Canada)..... 9,012
Premiums paid..... \$99,849.00
Benefits paid—Sickness..... 75,851.00

From these statements, it is seen that approximately 68,000 Canadians paid \$456,000 for sickness and funeral insurance in 1932 (average \$6.70 per caput), and received \$482,000 in sickness benefits and \$25,000 in funeral benefits.

Apparently 1932 was a bad year for the Benefit Societies as there was a considerable falling off in certificates and income, and the benefits paid exceeded the income, a condition of affairs which, obviously, could not continue for long without financial disaster.

- (g) *Hospital Services*—"Most communities have quite adequate general hospital accommodation . . . there is a woeful lack of provision for the convalescent patient, the chronic invalid, or the incurable. Our accommodation for the insane is inadequate and nobody wants to assume responsibility for the narcotic addict or the venereal case . . . This lack of complete provision of hospital service is the natural result of our inco-ordinated system of hospital erection."

A Directory of the Hospitals of Canada, with Maps, compiled by the Department of Hospital Service, Canadian Medical Association, issued by the Department of Pensions and National Health, Canada, 1929, gives the following information:—

	N.S.	N.B.	P.E.I.	Que.	Ont.	Man.	Sask.	Alb.	B.C.
Public General.....	23	19	3	49	133	33	68	72	71
Tuberculosis.....	3	2	1	6	11	2	2	1	3
Pædiatric.....	1	1	0	3	4	2	1	3	2
Public Maternity.....	1	1	0	3	1	0	0	3	0
Pensions and National Health.....	5	2	0	3	2	1	0	1	2
Mental and Neurological.....	5	1	1	10	15	3	2	3	2
Red Cross.....	0	2	0	0	22	5	15	2	1
Private.....	4	4	0	28	75	10	41	57	47
Isolation.....	1	1	0	3	6	1	1	4	1
Incurables.....	0	0	0	18	6	1	2	6	1
Others.....	0	0	0	2	5	0	0	0	0
Total.....	42	30	.5	116	250	52	117	150	125

XVIII—MEDICAL CARE OF THE INDIGENTS IN CANADA

The provinces are responsible for the care of indigents—British North America Act, 1867, 30 Victoria, Chapter 3, Section VI, Paragraph 92, Item 7: "Exclusive Powers of Provincial Legislatures. In each Province, the Legislature may exclusively make laws in relation to Matters coming within the Classes of Subjects next hereinafter enumerated; that is to say . . . The Establishment, Maintenance and Management of Hospitals, Asylums, Charities, and Eleemosynary Institutions in and for the Province, other than Marine Hospitals." All provinces have made some provision for the medical care of this group of their population.

BRITISH COLUMBIA

Pre-Depression—

"The only provision made for the care of indigents is the outdoor and charity work carried on in the general hospitals."

Depression—

"In the organized districts, Dominion and Province assume no responsibility for people who are resident there; for the unorganized districts and for the transients of no fixed abode, who are caught in the cities, some degree of medical care is provided."

"The city (Vancouver) has provided two medical men to carry on work among the indigent. . . . No provision is made for night work, and the city has simply left it to the private practitioner to carry on without pay."

A payment of twenty dollars is made for delivery of maternity cases in the home. Victoria pays physicians for relief cases a total not to exceed ten dollars a month.

Attitude of the Province—

The Committee for the Provision of Medical Care (December, 1933) recommended:

"The Committee does not feel that relief cases should be paid for on a per capita basis, nor that the work done should be limited to a certain number of men, but that every practising physician should be entitled to take such cases, that the patients should have free choice of their own doctor, and that the work (medical care of those on relief) should be paid for by an allotment to the profession of a certain sum monthly by the city and provincial government."

ALBERTA

Pre-Depression—

Alberta has encouraged the development of Municipal Hospitals. All assessable land in a hospital district contributes to the support of the hospital (about three cents per acre). Over one-half the rural population are served by these hospitals.

Depression—

In Calgary no provision has been made for the physician's services.

"The single men and women in Calgary who are unfit are sent to the first-aid station of the Red Cross Society, where a physician is in charge."

"In Edmonton, physicians are paid a fee of three dollars for a first call in attendance on unemployed patients. No other allowance is made for any other professional attention."

"In the city of Lethbridge, a sum of \$250 a month has been set aside for relief purposes

. . . . In Medicine Hat, the physicians have not received any assistance In local improvement districts, relief is distributed by the provincial government if the patient is indigent, a portion of the physician's fee is paid."

"Some municipalities have employed a physician on a salary to care for the indigents as well as act as medical officer. In some of the smaller centres, groups of citizens have engaged a physician at \$25 per year, paid in advance; in other instances, at \$18 per year, the half cash six months in advance."

Attitude of the Province—

"Cities and towns are letting the profession bear the burden. Partly for lack of funds and partly because the physicians and surgeons have been afraid to make any arrangement, fearing conditions may be established that will prove detrimental."

SASKATCHEWAN

Pre-Depression—

"In 1920, an amendment to the Municipal Act, making provision for the engaging of Municipal Doctors. This Act has been amended, and to-day reads as follows:

"Page 76, Cap. 106, Rural Municipalities. Care of Sick and Destitute.

"223 (1). The Council of every municipality shall make due provision for the care and treatment of any indigent person who has been a resident of the municipality for at least thirty days, who falls ill and requires medical attendance and treatment.

"(2). In this section and the following sections, the expression 'indigent person' means a person who is actually destitute of means, from his own resources, of obtaining necessary medical attendance and treatment.

"(3). All provision for medical care and treatment of indigent persons shall be made by means of a written order.

"(4). Such written order may be dispensed with in respect of medical advice, attendance, or medicines given by a medical practitioner at a first visit (or any other necessary treatment during the emergency; amendment, 1933), if the medical practitioner concerned certifies that the case was, or that he was informed that the case was, one of sudden and urgent necessity."

" the hospitals are guaranteed public ward rates from the municipalities for their indigent patients."

" the Government pays fifty cents per patient, for all patients under hospitalization, to the approved hospitals."

Depression—

"Since the depression, the conditions leave the municipalities in very straitened circumstances. From the hospital point of view, they are only accepting the bills for future payment. From the medical viewpoint, they only pay when they cannot get out of it. . . ."

"Most of the cities of Saskatchewan have conceded the right of the doctor to be paid for work done on relief cases. The city of Regina. . . . pays \$1.50 for each house call on an indigent. . . . \$20 is paid for a maternity case in the home; \$10 for one in the hospital. Operations and serious illnesses in the hospital are paid for at partial schedule fees, not more than fifty dollars being paid for any one case. The city pays nothing for

office visits. In Saskatoon. . . the doctor is given an order requesting him to render treatment. . . Surgical cases are paid for at the rate of 35 per cent of the schedule of fees. . . up to the maximum of fifty dollars; for maternity cases in the home is paid \$17.50, and \$1.50 for house visits; medical and maternity cases in the hospital and office visits are not paid for. . ."

"In Moose Jaw, one doctor has been appointed to look after the indigents for two hundred dollars a month. . . While the indigents are supposed to go to the city appointee for care, it is estimated that the medical men, as a whole, are looking after well over 50 per cent of the relief and indigent cases. . ."

"In Weyburn, six hundred dollars is divided equally among the four doctors there for care of any indigent who may present himself. . ."

"In Yorkton, the doctors look after all the indigents for nothing, but the city does not ask any of them to pay a business tax. . ."

"In North Battleford, the city council pays nothing for treatment of indigents."

"City Councils, in general, seem to take a fair and reasonable view of the doctor's work, but the rural municipal councils do not share these views. For the most part, now, they will pay a hospital bill, but paying the doctor is something they are not prepared to do. . ."

Attitude of the Province—

"On studying the Act, one could figure the indigent problem as settled, but legal phraseology seems to leave us considerably in the dark, and considerable dispute as to the definition of 'indigent' and the responsibility thereof."

"To date, we are still operating from the medical viewpoint as if there had never been a Municipal Act."

"Some municipalities accepted their responsibility to provide medical services under the Act, as above quoted, but a very large number of municipalities do not; they refuse to give the written order, and without this, nothing could be collected except for a first visit."

"... an unwilling Council could render nugatory the provisions of the Act."

MANITOBA

Pre-Depression—

"There is too great an uncertainty with regard to the payment, by municipalities, for medical services rendered to indigents, and no means of compelling municipalities to pay."

Depression—

"Since the early Spring (1933), there has been co-operation through a liaison committee between the doctors and a committee representing the unemployed on relief."

"After July first (1933), the hospital authorities (Winnipeg) segregated relief cases coming to the out-patient clinics. These appeared before a doctor for investigation as to emergency. Patients coming within that category were referred to the proper department. Others were returned to the municipal relief officer."

"Early in October, the Winnipeg General Hospital re-opened its out-patient clinic in a modified form. . . 'The Medical Service will be, as formerly, entirely voluntary on the part of the doctors in attendance. Patients will be admitted to the clinic on presentation of a letter from a practising physician. Only those who are unable to pay physicians' fees and the rates for special examinations and treatments are eligible.'"

"... The Rural Rehabilitation Commission has entered into an agreement with the Manitoba Medical Association for the medical care of those who have been placed back on the land under this scheme. A schedule of fees has been prepared and submitted to the Commission, and they are now paying the accounts in accordance with the schedule."

"The Manitoba medical profession also had a delegation wait upon the Minister of Health and the Honourable the Attorney-General in reference to medical services for wards of the Government, namely, inmates of mental institutions, gaols, et cetera."

Neglected children, as wards of the Government, receive medical services at the expense of the Government.

The medical profession of Greater Winnipeg, having failed to secure payment for medical care of the unemployed refused to give service except in case of emergency.

At a general meeting of the medical profession of Winnipeg, held in January, 1934, it was unanimously agreed "to refuse all care in the house, office or hospital to those on relief, except in cases of emergency." "An emergency is one in which life is in imminent danger, and for which immediate action is required." This action received the support of the press. A few days later, the city agreed to a plan for the payment of medical relief.

"Five of the largest municipalities contiguous to Winnipeg have already notified our committee that they will supply medical relief under the same plan and scale as that in force in Winnipeg."

Attitude of the Province—

"With the exception of single unemployed in camps, no payment is being made for medical services. The press has sympathized with our claims and supported them by numerous editorials and articles. There is no outspoken criticism on the part of the general public, and letters in that public forum, the columns of the press, are singularly few. Best of all, the profession is organized as never before. The numerous requests from practitioners for rulings and decisions by the executive on various problems show that they are prepared to play the game, and are giving the movement loyal support. Finally, the last move in the contest has not yet been made. More drastic action on the part of the profession is conceivable, but it must be justified before it can be taken. It is probable that the normal increase of illnesses during the winter will force the issue."

ONTARIO

Pre-Depression—

The Public Health Act, Section 51(1) requires that:—

"The corporation of every municipality shall enter into an agreement with the medical officer of health or some other legally-qualified medical practitioner resident in the municipality or in a municipality adjacent thereto for his medical attendance upon and care of persons suffering from the result of injury or disease, who, in the opinion of the head of the municipality, or of its relief officer, if any, are unable, through poverty, to pay for the necessary attendance, and who are not cared for in a public or private hospital."

Many municipalities have not carried out this clause of the Act.

Hospitals and sanatoria receive a per caput per diem allowance from the Province and the municipality for the care of indigent cases.

Depression—

"In October, 1932, the Government of the Province of Ontario, by Order-in-Council, made it possible for municipalities to include medical care as a part of relief expenditures to unemployed and their dependents. The Order stated that the municipality might pay for medical services and supplies at the rate of 50 per cent of the prevailing medical tariff. By regulations subsequently issued, each doctor in the Province was limited to a maximum amount of \$100 which he might receive for one month for services rendered, according to the above-mentioned Order-in-Council, the work to include office calls and home visits (including maternity cases), but not practice in hospitals or major surgery. As a special item, it did include the after-care of surgical cases in the home, but it should be emphasized that major surgery in the hospital or in the home was excluded from payment. The Provincial Government undertook to pay two-thirds of the cost and the municipality one-third. It was originally thought that the Federal Government would pay one-third of the cost, but this was later decided against by the authorities at Ottawa, and the Provincial Government then had to assume the burden. As a matter of actual practice, the Provincial Government is paying a good deal more than two-thirds of the cost in those areas where unemployment and relief have imposed a heavy burden on the municipality."

Attitude of the Province—

"One weakness in the plan was the fact that to each municipality was left the decision as to whether they would accept the Government's proposal. A number of municipalities have taken advantage of the offer, while a great many have not. Broadly speaking, where the scheme has been applied, it has been approved by all concerned."

QUEBEC

Pre-Depression—

"Hospitals and sanatoria receive a per caput per diem allowance from the Province and the municipality for the care of indigent cases, at the option of the municipality.

"No provision is made to recompense the doctors for their services which they give to these indigents, and while they are taxed equally with the rest of the population to support the institutions, they are, in addition, expected to give their services to these institutions free. This is a poor principle and unjust to the profession.

"No provision is made for the medical care of indigents outside of such institutions."

"In sparsely-settled areas and poor rural districts, and unorganized territories, such as the lower Saguenay and North Shore, where the population cannot support a licensed practitioner, the Provincial Bureau of Health will occasionally subsidize a doctor, or place a resident trained nurse, or even maintain a small hospital to look after the medical needs of the district."

Depression—

"There has been no change regarding the provision of medical care for the indigent since the depression. One city started to pay for medical care, but discontinued after a week."

The same city, at a later date, agreed to pay a fixed sum of \$50 a month to physicians treating the unemployed, and to pay druggists for medicines prescribed, but not for patent medicines.

NEW BRUNSWICK—

Pre-Depression—

"The only provision made for the medical care of indigents is through the medium of the Alms House Commission in each parish, or that of the Parish Councillors, who issue a special order for treatment to each particular patient, if warranted by circumstances. The medical fees allowed in these cases are usually 50 per cent of the regular tariff of fees."

Depression—

"No change in regulation has been made since the depression."

Attitude of the Province—

"At the present time, it is safe to say most physicians in the province treat over 50 per cent of their cases without the hope of ever being paid for their services."

NOVA SCOTIA

Pre-Depression—

"The Municipal Council may pay for the care of a certain number of patients as they may see fit."

"The City of Halifax makes a grant towards the Dalhousie Public Health Clinic, which is open to all the indigents in Halifax."

Depression—

"There has been no change made in Nova Scotia since the depression for the care of indigents."

Attitude of the Province—

"The situation in Nova Scotia is urgent."

PRINCE EDWARD ISLAND

Pre-Depression—

Medical care is furnished by three public hospitals, each of which receives a government grant yearly.

Depression—

No change.

Attitude of the Province—

"No consideration has been given the medical profession who are giving a good deal of treatment gratis in such cases."

COMMENT

These brief statements from the various provinces show very clearly that, in ordinary times, outside of a contribution to hospitalization costs, provincial and municipal governments have not, in general, recognized their responsibility for the provision of medical care for the indigent. Further, it would appear that the Federal Government did not regard medical care as one of the necessities of life; otherwise, medical care would have been provided for in the unemployment relief legislation, together with food, shelter and clothing.

During the time when nearly all medical practitioners could be described as family doctors, the number of indigents was comparatively small, and the burden on any one doctor was not severe. In the course of time, however, the family doctor, in the larger centres of population, has been replaced by a group of specialists who are called by the family, depending upon which of the members is ill, or which part of the body appears to be diseased. More frequent moving of the population has tended to break the bond between doctor and family. Better transportation facilities have increased the area of practice, on the one hand, and on the other, the ability of the public to go here and there for medical care.

At the same time, as these changes were taking place, an increased industrialization resulted in a

higher percentage of the population being indigent at times, as a result of unemployment, accidents or sickness. The outcome has been that gradually the medical profession has provided medical care to an increasing number of indigent persons.

The idea that the profession should do this has come to be accepted by governments and by the public. The point should be clearly made that no such obligation rests upon the medical profession, and that what has been done and is being done is in the nature of a voluntary contribution of service by the individual physician.

So firmly is this idea fixed that surprise has been expressed that physicians should expect to be paid for the medical care of the indigent, whose care is a responsibility of the State, a responsibility to be shared by all citizens and not merely by the medical profession. The State apparently believes that when a grant has been made for the institutional care of the indigent it is not necessary to make the grant sufficient for, or to provide a special grant for, medical attendance. It was because no sound policy of dealing with this question had been devised that the medical profession became overwhelmed by the demands on them growing out of the depression.

That those outside of the medical profession, who are close to the problem, realize that the situation is undesirable and unfair is shown by the resolutions passed at a Conference on Relief, held at Ottawa in May, 1933, with representatives present of official and voluntary welfare agencies from all over Canada.

The opinion of the Conference was expressed in the following resolutions:—

1. In the opinion of your Committee, a paramount duty of the State, in all its branches, is the maintenance of the health of the people.
2. In our opinion, in respect to relief being given to unemployed persons of Canada with their dependents in their own homes, medical care should be included.
3. Medical care shall mean and include the services of a medical practitioner, dentist, nurses, and other related care.
4. The necessary medical supplies and drugs shall be considered a part of this care.
5. Drugs and medical supplies, under the meaning of these terms, should only be given upon medical authority.
6. The above services should be available through the existing channels as far as possible, and the personal relation of doctor and patient should not be disturbed.
7. Your Committee views with approval the present facilities in Canada with respect to Public Health Services, and would most respectfully urge that these services be maintained and extended.
8. A further suggestion recommended that moneys available for unemployment relief, from any or all sources, should be made available for medical care. However, after lengthy discussion, in

which the possible relationship of such widespread public provisions of medical care to public health services and to any contemplated plans of Dominion aid or health insurance was stressed, it was agreed, upon division, to endorse these seven principles, as above set forth; to record recognition of the need of financial aid on a broad basis for the provision of health and medical care; but to refer the question of the provision of that aid to the Dominion Health Council for consideration at their June meeting.

The Dominion Health Council gave the matter careful consideration, and passed the following resolution:—

WHEREAS the physical and mental well-being of the people of this Dominion is of paramount importance;

AND WHEREAS medical care for those in receipt of relief, up to the present time, has not been given the consideration it is entitled to and is not considered as part of the general relief programme; THEREFORE, BE IT RESOLVED that the Dominion Council of Health recommend that the medical care of those on relief be included with food, clothing and shelter, and be paid for out of the Dominion, provincial, or municipal funds available for relief purposes, such medical relief to consist of medical and nursing care in the patient's own home or the doctor's office; and that, in so far as possible, this medical care be given by the medical services now available, the individual requiring the service to have, where such is feasible, the choice of physician or nurse; and that the organized medical profession be asked to supply this service, at special rates to cover the cost to the physician or nurse of dispensing this service.

XIX.—MEDICAL CARE OF THE MIDDLE-CLASS IN CANADA

An indigent is defined as a person who is needy or poor. Those who administer laws dealing with indigents have many different interpretations of the definition—some broad, some narrow. Indigence is difficult to define rigidly and fairly, but it should be clear that a person need not be actually destitute to be indigent from the point of view of medical care. A married man with a family, who is earning ten or twelve dollars a week, is indigent in so far as medical care is concerned, because after he has attempted to house, feed and clothe his family, he is certainly without the means of obtaining medical care.

At whatever level we define indigence, from that point up the economic scale, we have the middle-class, until we come to another level which is equally hard to fix, that at which the middle-class merges into the state of the well-to-do. For our purpose, middle-class would include those who have something more than the bare necessities of life, but not enough to meet a severe or prolonged illness without economic difficulty.

From the publications of the Dominion Bureau of Statistics, the following information is taken:—

GAINFULLY EMPLOYED, BY OCCUPATION, CANADA, 1931.

Total	3,924,533		
Agricultural	1,128,813	Fishing, Hunting, Trapping.....	47,917
Logging	43,983	Mining, Milling, Quarrying, Oil	
Manufacturing	442,759	and Salt Wells (coal, 27,750)	89,410
Railway Transportation	83,780	Warehousing and Storage.....	35,195
Water Transportation	29,648	Commercial	313,931
Road Transportation	96,275	Finance, Insurance	36,818
Other Transportation	56,165	Professional	240,785
Public Administration and		Entertainment and Sport.....	8,081
Defence	31,467	Laundering, Cleaning, etc.....	22,593
Personal Service	334,563	Labourers (not agricultural,	
Clerical	238,883	mining, or logging).....	437,032

DOMINION INCOME TAXPAYERS

Income (gross)	Number of taxpayers		
	1930	1931	1932
Under \$2,000	38,709	38,788	37,002
\$ 2,000 to \$ 3,000	20,090	20,885	19,595
3,000 to 4,000	24,429	22,869	21,160
4,000 to 5,000	17,468	17,909	16,555
5,000 to 6,000	10,980	11,348	10,410
6,000 to 7,000	7,349	7,483	6,839
7,000 to 8,000	4,620	4,814	4,573
8,000 to 9,000	3,313	3,449	3,238
9,000 to 10,000	2,607	2,609	2,462
10,000 to 15,000	6,575	6,825	5,901
15,000 to 20,000	2,540	2,878	2,405
20,000 to 25,000	1,181	1,314	1,123
25,000 to 30,000	674	784	646
30,000 to 50,000	1,016	1,045	1,098
50,000 and over	603	601	614
	142,154	143,601	133,621

INDIVIDUALS PAYING DOMINION INCOME TAX, AND TAX COLLECTED BY PROVINCE, 1932.

Province	No. of taxpayers	Per cent	Tax collected	Per cent
Prince Edward Island....	363	.27	\$ 29,509	.119
Nova Scotia	3,589	2.68	400,802	1.618
New Brunswick	2,668	2.00	313,312	1.265
Quebec	29,368	21.98	8,735,717	35.263
Ontario	60,358	45.18	11,575,632	46.728
Manitoba	10,007	7.49	1,025,787	4.141
Saskatchewan	5,479	4.10	255,187	1.030
Alberta	7,807	5.84	832,471	3.360
British Columbia	13,658	10.22	1,596,570	6.445
Yukon	324	.24	7,306	.029
Head Office	553	.002
Total	133,621	100.00	\$24,772,846	100.00

Everything is relative, but the number of individuals with large incomes are but a small percentage of the total population. Hourly wages have led us to believe that incomes among tradesmen and mechanics are much higher than they actually are on a yearly basis, due to irregularity of work.

If we take the approximate figures of 140,000 taxpayers and presume that these individuals are all married, with an average-size family of 5, we have 700,000 individuals, in families, where the gross income is taxable, leaving 9,600,000 individuals, either living alone or in families, without a taxable gross income.

The Canada Year Book, 1931, shows that in Canadian manufacturing industries, with 91,243 salaried employees, the average salary, in 1927, was \$1,899, and in 1928, \$1,915. The wages of the 566,780 employees on wages averaged \$997 for 1927, and \$1,024 for 1928, with an average of 245 days in full- and part-time operation of the industries.

The average earnings of wage-earners advanced from \$760 in 1917 to \$1,024 in 1928, representing an increase of 16 per cent in the advance of real wages.

For the twelve months, June, 1930, to June, 1931, the average earnings of 528,538 female wage-earners was \$560, with an average of 46.5 weeks' employment. For the same period, 1,948,500 male wage-earners earned an average of \$927, and worked, on an average, 41.2 weeks in the year.

It is quite true that averages are apt to be misleading, but there is not a very wide variation in wages, so that it seems fair to assume that, in times that are good economically (1927-28) or in periods of depression (1930-31), the average wages (males) are between \$927 and \$1,024.

The mass of the population evidently belong to the wage-earning group.

The position of this group, taken as a whole, is that they are able to meet the costs of minor illness, although even this imposes hardship when the family is large or when the illness coincides with unemployment, but they are unable to cope with severe, prolonged, or chronic illness for the simple reason that they have not a surplus over what is used to provide the necessities of life to pay the costs of such illness.

From the 1931 census, it was learned that, of a total of 2,566,001 wage-earners, 1,027,749 lost 25,503, 710 weeks' work, in one year, from all causes. Illness (excluding accidents) was given as the cause by 112,647 wage-earners (89,474 males and 23,173 females) for 1,406,190 weeks' lost time.

This means that one out of every twenty-three workers lost time on account of illness, and the average lost time for this group, absent on account of illness, was over twelve weeks.

The value of these figures is minimized by the fact that they cover a period of depression: nevertheless, they show that there is lost an equivalent amount of time to the full-time employment of over 27,000 individuals (over one per cent of the total number of wage-earners).

Adult Disease in an Industrial Population (Montreal).

From a report by Dr. R. Vance Ward, appearing in the *Canadian Public Health Journal*, September, 1932, the following is abstracted:—

In nearly every case, lost time rises to a peak about January or February, and falls to a minimum in late summer or early autumn.

It has always been assumed that lost time from sickness is approximately 2 per cent. As you see, our men lost substantially less than this, and our women considerably more. The figures are, however, a fair approximation

PERCENTAGE OF TOTAL TIME LOST BY 1,200 WOMEN
(86 PER CENT UNDER 30 YEARS) DUE TO
CERTAIN SPECIFIED CAUSES.

<i>Years—1929-31 inclusive—Total Days Lost, 20,577½</i>	
	<i>Per cent</i>
Minor respiratory diseases.....	27.6
Minor digestive disturbances.....	12.8
Dysmenorrhœa	11.3
Tuberculosis	9.3
Non-industrial accidents	4.6
Arthritis, gout, lumbago.....	4.5
Appendicitis	3.1
Pleurisy (not associated with pneumonia)..	1.2
Skin infections	1.7
Pneumonia	0.2
Chronic cardiac valvular disease.....	0.1
	76.4

PERCENTAGE OF TOTAL TIME LOST BY 2,100 MEN
(TYPICAL AGE DISTRIBUTION) DUE TO
CERTAIN SPECIFIED CAUSES

<i>Years—1929-31 inclusive—Total Days Lost, 27,068</i>	
	<i>Per cent</i>
Minor respiratory diseases.....	22.9
Arthritis, gout, lumbago.....	9.7
Tuberculosis	9.1
Minor digestive disturbances.....	7.1
Heart disease; old age, 6.0; rheumatism, 0.9	6.9
Non-industrial accidents	6.2
Peptic ulcer	3.7
Appendicitis	2.2
Skin infections	2.1
Pneumonia	2.0
Pleurisy	1.5
Cerebral hæmorrhage and thrombosis.....	1.1
Carcinoma	0.9
	75.4

WHAT HAS BEEN DONE IN CANADA FOR THE
MIDDLE-CLASS

The Municipal Physician system is the most novel contribution made in Canada to the solution of the problem. This system has been in operation for fourteen years.

SASKATCHEWAN

The Revised Statutes of Saskatchewan, 1930, Chapter 106, Section 175, AN ACT RESPECTING RURAL MUNICIPALITIES:—

"The Council may, at a regular meeting or at a special meeting called for the purpose, resolve to submit to the electors a by-law empowering the Council to engage the services of a legally-qualified medical practitioner for the municipality at a salary not to exceed Five Thousand Dollars per annum, and may submit the same to the electors for their approval as hereinafter mentioned."

In June, 1933, thirty-seven rural municipalities in Saskatchewan were served by a full-time municipal physician; over thirty by a part-time municipal physi-

cian; nine municipalities have passed the necessary by-law, but have not made the appointment.

The law requires that all contracts between the municipality and the municipal doctor must be submitted for the approval of the Minister of Health. In practice, this is of no value as the Minister has no authority to enforce his decision in the matter.

The medical profession of the province express dissatisfaction with the municipal physician plan of Saskatchewan for the following reasons:—

1. It is an individual agreement.
2. The doctor becomes a full-time salaried employee.
3. The organized medical profession has no place in the plan.
4. Being based on one municipal area, economic stability is not provided for. (During recent years, a number of municipal physicians have been unable to collect their salaries, due to crop failure in the area concerned).

UNION HOSPITAL ACT—SASKATCHEWAN

Upon petition for its establishment, the Lieutenant-Governor-in-Council defines a union hospital district and the location of the hospital. The proposal, including sketch of proposed hospital and the costs, is submitted to a vote, and for approval requires the votes of two-thirds of those voting. The cost of building and any deficit of operation is met by a tax on the ratepayers in the hospital district. A district may provide hospital treatment, in whole or in part, at the expense of the municipalities.

There are twenty union hospitals with a bed capacity of four hundred and eighty-three. In seventeen of the rural municipalities included in the hospital districts, treatment is provided at the expense of the municipalities in whole, and in nine others in part.

"The union hospital system has very largely solved the problem of providing hospital accommodation for the more rural areas in Saskatchewan."

MANITOBA

MUNICIPAL PHYSICIAN.—An Act Respecting Municipal Institutions, Part X, Division 1.

This Act requires approval by at least three-fifths of the ratepayers who actually vote thereon for the appointment of a municipal physician.

"881. If, at the time of the first reading of a by-law for engaging a physician, there be a physician or physicians resident in the district described in the petition, the municipality or municipalities, in submitting the proposed by-law to the vote of the ratepayers, shall, on the ballot used at such voting, make provision for ascertaining the preference of the voters as to whether or not the resident physician, or, if more than one, which resident physician, or any other physician whose name is submitted to the council, or one of the councils, ought to be appointed if the by-law be approved."

"883. The contract between the municipality or municipalities and the physician appointed shall be authorized by by-law of each municipality concerned, shall be in writing duly executed by the parties thereto, embodied in a form prepared by the Minister of Health and Public Welfare, and, to be valid and binding, shall be approved by him."

The form of agreement used includes:—

"4. If the Party of the Second Part (physician) has reason to believe that this Contract is being terminated without just cause, he shall have the right to demand a hearing before a board of appeal, composed of one member appointed by the Municipal Commissioner, or his Deputy; one member appointed by the Manitoba Medical Association; and a third member chosen by the

two appointed. The decision of this Board shall be final and binding on both Parties for a further period of three months."

In Manitoba, five rural municipalities have appointed municipal physicians.

ALBERTA

Section 160 of The Municipal Districts Act.

"The Council may pass a by-law for the purpose of making an annual or other grant to a duly-licensed medical practitioner residing and practising in the municipal district or to a duly-licensed medical practitioner, as an inducement for him to reside or practise his profession in the municipal district. . . . providing, however, that the amount paid in any one year, under such a guarantee, shall not exceed two thousand dollars."

The Act also provides for the engagement of nurses, for municipalities to join together in engaging a physician or nurse, and the collection of money required to pay for such services by a special tax on property.

MUNICIPAL HOSPITALS ACT—ALBERTA

The first Municipal Hospitals Act was passed in 1917, and the first municipal hospital was opened in 1919. Municipal Hospital districts are established by the Minister of Health, upon the request of the Councils of the municipalities concerned. The plan is submitted to a vote of the ratepayers at which time full particulars are given. A two-thirds majority of those voting is required.

The usual rate charged in municipal hospitals to ratepayers is \$1.00 per day. Administration is by a Board, partly elected and partly appointed. There are twenty-two municipal hospitals serving forty-three urban municipalities, which include one-third of the rural population. The average cost in 1932 was \$2.74 per patient day. The average hospital tax works out at \$4.80 per quarter section, the actual tax being a mill rate on the assessed value.

XX.—WORKMEN'S COMPENSATION

Workmen's Compensation began under the common law when the employer was liable only if guilty of negligence and the employee could prove the employer to be at fault. The Employers' Liability Act of England, 1880, made the employer liable unless the disability were due to the fault of the employee or grew out of some condition beyond the control of the employer. This Act was followed by the Workmen's Compensation Act, which recognizes occupational risk as a charge against industry, or as a part of the cost of production.

The first Act in Canada was passed by Quebec in 1909, and similar action followed by all provinces excepting Prince Edward Island. These various Acts differ considerably in detail. Each Act specifies the industries to be included. A minimum waiting period for which disability is not compensated ranges from none to seven days. The scale of compensation varies considerably in the different provinces.

Disabilities due to diseases which are occupational are compensable to some degree in seven provinces, but the list of diseases varies somewhat. In Ontario, 1929, there were 108 cases of industrial diseases for which compensation was paid.

All provinces administering workmen's compensation acts have State insurance funds. The Acts are administered by an appointed board whose decision is final.

Medical aid is provided, according to a schedule adopted by the Board, in addition to compensation benefits. Most provinces pay this out of the Board's accident fund. In British Columbia and Alberta, the workers contribute to the accident fund.

XXI.—PROVINCIAL ACTION

BRITISH COLUMBIA

A Royal Commission on State Health Insurance and Maternity Benefits was appointed in April, 1929. A Progress Report was published in 1930, and the Final Report in 1932.

The conclusion of the Royal Commission was:—

"Finally, we would say that our recommendations for the early establishment in British Columbia of a suitable compulsory health insurance plan, including maternity benefits, are the result of the members of our Commission having become thoroughly imbued with the momentous and incalculable beneficial effects which kindred schemes in the Old World are producing in alleviating for the poorer classes the dread incubus of sickness costs, and thereby reducing premature mortality and raising the general standard of health among the masses."

The British Columbia Medical Association expressed the following views to the Commission.

1. Everyone should pay, out of what he earns, to provide for the cost of sickness. There should be ultimately no charity.
2. An estimate should be made of the responsibility, for sickness, of the State; Industry; Worker; and these should be assessed accordingly.
3. If any system is adopted, it should provide complete service—hospitals, x-ray, laboratory, specialists, et cetera.
4. Wives and families should be included.
5. The system should be compulsory for all whose income falls below a certain figure.
6. There should be a free choice of doctor by patient and of patient by doctor, as at present. Every legally qualified medical man should be eligible by law to practise under this Act, provided, however, that the Board may have power to discipline or suspend any practitioner for just cause.
7. Payment should be for services rendered, according to schedule of fees of the British Columbia Medical Association, and on the principle of the present Workmen's Compensation Act schedule (practically 66 2/3 per cent of the British Columbia Medical Association).
8. Insurance companies and benevolent societies should be barred as carriers under this Act.
9. Ample provision should be made for preventive and health work. This, however, should be entirely divorced from therapeutic work, and would best be done by salaried workers.

ALBERTA

Report of the Inquiry into Systems of State Medicine, Alberta, 1929.

The following quotation is from the Abstract of the Report:—

"British experience with health insurance points to the danger of imposing extensive State schemes of medical treatment on top of unco-ordinated existing health service. The need of a long range, comprehensive and co-ordinated scheme of medical treatment and public health activity is emphasized."

Progress Report, Alberta Commission, 1933.

The following are some of the findings of the Commission:—

"Adequate medical services for all the people of Alberta can only be secured through the operation of a contributory health insurance scheme."

"The fundamental factor requisite for the success of any insurance scheme is the participation of a number large enough that the premiums received may be adequate to provide for current expenditures and to provide a reserve fund for emergent situations.

"For chronic and incurable diseases, a system of invalidity insurance should be established, and institutions for such cases should be provided. Separate health insurance and invalidity funds should be maintained."

Plan.

"Each of the enlarged Health Units previously mentioned would have at least one central hospital, so equipped, staffed and administered, as herein outlined, to provide all ordinary medical and surgical services.

"Each of these enlarged Health Units might be sub-divided into medical districts on a combined population-area basis (say 1,500 population x 325 square miles) within certain limits.

"Such full-time Health Units could be utilized as the administrative centres for each unit of the proposed Health Insurance Scheme in the rural part of the Province.

"With a trained staff in the field of preventive medicine, co-operating with the practitioner in curative medicine and with the assistance of community-welfare organizations, the most complete type of medical service will be assured to the people of Alberta."

Submission of the College of Physicians and Surgeons to the Commission, Alberta, 1932.

"There has always been a large number of people whose illnesses have been looked after adequately, although they have been unable to pay for these services. The ethical wisdom, or the economic soundness of continuing this state of affairs may be seriously doubted. . . .

"It is nevertheless very important that, in facing the whole problem, we shall not allow ourselves, as members of the community, or as members of the profession involved, to be forced by the exigencies of the present crisis to formulate and seek to adopt any scheme which, while acceptable at present, would not be in the best interests of all concerned under more normal economic conditions.

"As far as we are able to ascertain the feelings of the medical profession of Alberta, with regard to State Health Insurance, there is a wide divergence of opinion:

1. Some, in our opinion a small minority, favour leaving things as they are;
2. Some, in our opinion a small minority, are willing or even anxious for a system which will ensure them a fixed income;
3. In our opinion, a considerable majority of the profession in this province would welcome a scheme of State Health Insurance which would include certain important provisions."

SUMMARY

"Whenever a system of State Health Insurance is introduced into this Province, it should include the following provisions:—

1. The employment of municipal doctors in only those rural areas in which, because of local conditions, doctors would be unwilling to locate because of the comparatively limited amount of work available.

We wish to emphasize the fact that the Council is definitely opposed to a policy which would

place any large section of the profession on a salary basis.

2. The bringing of all the rest of the rural area and all the urban population with an income level of \$1,800 and under, and including indigent residents, within the scope of action of a system of Health Insurance, subject to the conditions outlined above.
3. The maintenance of two fundamental principles which are of the greatest importance to the patient and the medical practitioner—
 - (a) That the patient shall have the right of choice of the doctor that is called to treat his case;
 - (b) That the doctor shall be paid for his work on the basis of specified fees for actual services rendered.
4. The provision under the scheme of all needed consultant and specialist services.
5. The provision under the scheme of hospitalization as required.
6. The provision for the care of incurables and chronic invalids, and convalescents, in suitable institutions separate from, and operated independently of the Active Treatment Hospital.
7. The extension of Public Health service by furnishing, within the enlarged municipal areas, such a health service as is now being undertaken within the existing Health Units.
8. Provision, in each enlarged municipal area or a combination of such areas, of an Isolation Hospital with arrangements for special financial assistance from the Provincial Government.
9. Extension of Provincial Mental Hospital and Tuberculosis Sanatorium as required, and financed by a Provincial undertaking."

Final Report of the Legislative Committee, Alberta, 1934.

"'State Health Insurance' means a system of State insurance for health purposes. Under a system of health insurance, a non-profit-earning, State-supervised organization administers a fund, provided through regular periodic contributions, for the mutual provision of medical services for the beneficiaries included under the system.

"Time and opportunity for post-graduate studies should be provided and examinations should be conducted at five-year intervals to determine whether or not the practitioner is keeping in touch with the recent information pertaining to the practice of his profession.

"We consider that specialization is an essential feature of any progressive organization, and in order that the interests of the public and those specializing be safeguarded, we consider it essential that existing statutory provision for the certification of specialists be enforced rigidly."

The requirements are given as one physician per thousand of population; one dentist per two thousand of population; one nurse per five hundred of population; and one hospital bed per two hundred and fifty of population.

"Your commission wishes to express the conviction that any system of medical administration which does not make provision for prevention cannot function in the best interests of the insured . . . and all preventive and curative health services must be closely co-ordinated if efficiency is to be maintained.

"Such full-time health units could be utilized as the administrative centres for each unit of the proposed health insurance scheme in the rural part of the Province.

"It is the opinion of your Commission that adequate medical services will never be available to all the people of Alberta until income-earners, through a system of compulsory contribution, contribute a monthly sum sufficient to provide adequate medical services for all the people of the Province."

With regard to the unemployed:—

"The cost of the care of this group should be a charge on the collective funds of any plan, and should be included in the budget of any scheme."

"Your Commission recommends that a State fund, centrally controlled and administered by a State board, be established. It further recommends that local advisory committees be established for each unit."

"For the guidance of those responsible for the preparation of this schedule, your Commission wishes to go on record as in favour of an adjusted schedule providing a more equitable ratio between the fees for medical and surgical services; and between fees for general and specialized services. Your Commission is of the opinion that the existing schedule of fees for surgical and specialized services is too high."

The Commission divided their recommendations into two groups; for early application and for ultimate application.

Under early application:

"Treatment—

1. That at least two demonstration 'set-ups', one rural and one urban, be provided for the purpose of demonstrating a contributory health insurance scheme.
2. That municipal districts be urged to avail themselves of the statutory provision whereby municipalities may make grants to physicians."

For ultimate adoption:

"A Health Insurance Scheme".

Those included: Every individual in the Province of Alberta who has established legal residence in the Province.

Those contributing: Every income-earner in the Province of Alberta.

"A central board, on which the various contributing groups would have representation, should be established to decide matters of important policy."

"Payment for medical services under this plan would be on a services-rendered basis."

"The central administrative staff would receive and disburse all funds collected, and would be subject to the control of the central Provincial board above mentioned."

"For the better developed of these (frontier areas) districts, we recommend the establishment of a State-subsidized medical officer, assisted by a nurse. Some of these districts might be served by a nursing service only. In these districts, we believe that a travelling clinic can give the type of service in minor surgery, best suited to the needs and resources of the district."

The Travelling Clinic.

The Travelling Clinic was organized to meet the needs of those living in the more remote parts of the Province. The present arrangement is that a group of school districts request a visit from the clinic, and agree to provide building, beds, et cetera. A preliminary inspection of the school population is made by a public health nurse, who selects cases for reference to the clinic at the time of their visit.

The first day is given to examinations by physicians and dentists. Dental treatments are given where needed. A surgeon is one of the personnel, and he performs such operations as are required. Every opportunity is taken to give health teaching. Charges are made according to ability to pay.

In 1931, the Travelling Clinic operated twenty-one clinic centres, from June 3 to September 16, serving 210 districts. The public health nurse inspected 4,707 children; 3,179 were examined by the clinic physicians; 676 operations for tonsils and adenoids, and 69 minor operations were performed; 1,196 children were given dental treatment. The staff was as follows:— 1 surgeon, 1 physician, 2 dentists, and 4 nurses.

SASKATCHEWAN

*Saskatchewan Medical Association Annual Meeting,
February, 1933*

*Reports of Committee on Amendments to the
Manitoba Medical Act,
and*

*Committee Regarding Indigents and Rural
Municipal Relations.*

These Committees made certain recommendations which were adopted after amendment. We quote from these:—

"That we recommend a drawing-up by the Department of Public Health and the Council of the College of Physicians and Surgeons, and the Executive of the Association of Rural Municipalities, of a standard form to be used as a basis of contract between physician and rural municipalities entering into agreements for a Municipal Doctor, including a minimum salary per township."

"This standard form, having been entered into by any Municipality and Physician shall be submitted to the Minister of Health in the Province for his approval, before becoming valid."

Report of Special Committee on a System of Health Insurance for Saskatchewan (Adopted at Annual Meeting).

"We, therefore, recommend that the Saskatchewan Medical Association, through a Committee, approach the various social organizations who are, or may become, interested in the provision of adequate medical care to the people of the Province, at as reasonable a cost as possible, for the purpose of discussing with them and, if possible, obtaining their approval."

"We, as a Committee, recommend Health Insurance as a basis for that study."

"In submitting this, we submit what we think to be the cardinal principles as necessary from the medical point of view, culled from the various reports to hand, namely:—

1. Patients should have the right to exercise their choice of a physician wherever two or more physicians are available.
2. From the medical standpoint, the family physician should be the centre of any successful plan and the specialist should be secondary but readily at the call of the family doctor. This would apply also to the consultant who should be available when called by the physician.
3. The physician should not be on salary, but should be paid by the fees agreed upon by the medical profession and the Health Insurance Commission, and thus be paid for the work actually done.
4. No 'patch-work' system should be adopted, but should cover the whole Province and give

service to all those with minimum incomes, including the rural population.

5. The system should provide the greatest possible incentives for the profession to do post-graduate work and thus keep up with the current of proved knowledge.
6. Any plan at the present time should not embody the principle of financial compensation for time lost through illness.
7. Definite and well-recognized precautions should be taken to prevent excessive costs to the community through hospitalization and medical treatment of malingers.
8. Preventive Medicine, with all that it includes, should be a prominent feature of any health insurance scheme.
9. The scheme should be contributory and compulsory.
10. As members of the medical profession, we are particularly interested to demand that the existing relations between doctor and patient should be maintained, that the ethics of 'professional secrecy' should be respected, and that 'freedom of prescribing', with agreed restrictions, should be provided for.
11. That, in arbitration of any disputed point as between the contracting parties, viz.: Qualification of practitioner, fees, duration of illness, et cetera, the medical profession should be represented by the Province of Saskatchewan Medical Association, either directly or through a regularly appointed committee."

Tuberculosis.

On January 1, 1929, the amendment to the Sanatoria and Hospitals Act became effective. This amendment made available free treatment for tuberculosis, in Saskatchewan, and provided for the operating cost on the following basis:—

"The Government grant is one dollar per patient per day and the balance of the operating cost is to be borne by urban and rural municipalities proportionately, on the basis of their equalized assessments.

"In 1929, the operating cost per patient per day at the sanatoria was \$3.02. This included medical, nursing, laboratory and x-ray service. By 1932, the cost had decreased to \$2.25."

Maternity Grants.

Beginning in 1920, the Province of Saskatchewan granted \$25 to assist expectant mothers to obtain medical care. This grant was discontinued in 1932, owing to the depletion of the provincial treasury.

Year	Number Receiving Grant	Cost
1920	18	\$ 411.00
1921	125	3,120.00
1922	253	6,275.00
1923	286	6,355.00
1924	427	9,469.00
1925	417	10,595.00
1926	496	11,852.00
1927	505	8,450.00
1928	467	11,100.00
1929	585	12,964.00
1930	1,122	25,258.00
1931	3,020	64,116.00

Of the \$64,116 paid out in maternity grants during 1931, the sum of \$26,465.50 was received by 1,766 doctors.

MANITOBA

A Joint Medical Service Committee was appointed by the College of Physicians and Surgeons and the Manitoba Medical Association in 1930, under the following instructions:—

"That the purpose of the Committee be to study, investigate and correlate such data as are obtainable in reference to possible schemes of State Medical Services, and to decide what plan would be most acceptable to the medical profession of the Province, and to report to the College of Physicians and Surgeons and the Manitoba Medical Executive."

The findings of this Committee were:—

1. That the system of medical provision which we should seek to establish is one which would give to all who need it every kind of treatment necessary for the care or alleviation of disease, and would utilize for this purpose every class of medical practitioner; and that a satisfactory system of medical service must be directed to the prevention of disease no less than to the relief of individual sufferers;
2. And that any method or methods which may be devised should be adaptable to rural and urban communities;
3. And that the medical service of the community must be based on the provision for every individual, of a general practitioner or family doctor, giving to all a free choice of doctor so far as conditions will permit;
4. And that a consultant service and all forms of diagnosis and treatment should be available for the individual patient, normally through the agency of the family doctor;
5. And that the interposition of any third party between the doctor and the patient, as far as actual medical attendance is concerned, shall be as limited as possible;
6. And that as regards the control of the purely professional side of the service, the guaranteeing of the quality of the service, and the discipline of the doctors taking part in it, responsibility should be placed on the organized medical profession;
7. And that in the making of any arrangement for communal, subsidized or insurance medical service, the organized medical profession should be freely consulted, from the outset, on all professional matters, by those responsible for the financial and administrative control of that service;
8. And that the medical benefits should be available to the dependents of all persons connected thereunder;
9. And that every effort should be made to provide medical and nursing service facilities in institutions where the family doctor may treat those of his own patients who need such provision and who can thus remain under his care;
10. And that under any method of assuring and supplying medical services, all and every service rendered by the profession shall be paid for at reasonable rates previously agreed upon.

The Committee did not deem it advisable to submit any plan.

ONTARIO

The Royal Commission on Public Welfare, Ontario, 1930.

"The principle that 'public', alias non-paying patients, in the General Hospital should be a complete charge on public funds, should, we think, be frankly and fully recognized and adopted."

Ontario Medical Association.

The Ontario Medical Association was early in the field to study the question of State Medicine. The activities of an unofficial group paved the way for the first round-table meeting which was held as part of the program of the Canadian Medical Association week at Hamilton in 1918. The Ontario Medical Association appointed, in 1920, a Committee on State Medicine, the name being soon changed to the Inter-Relations of the Medical Profession and the Public. The committee has reported at an open round-table meeting almost every year since that time. The annual reports of the Ontario Medical Association carry the reports of the committee.

The report for the year 1930-31 (the local nucleus for the year was located in Hamilton) covers a review of the situation in this and other countries, a statement of the advantages and disadvantages of our present system, a discussion of budgeting in relation to medical costs leading to certain conclusions:

1. The basis for the plan should be the present medical service;
2. The fundamental principle of the plan should be the primary relation of the family and the family physician;
3. The acceptance of diagnosis as the scientific basis of the medical service, and the elimination of free treatment in so far as possible, except as an assistance to diagnosis;
4. The recognition of prevention as the ideal of the service;
5. Development of the out-door department of the hospital as an organized health centre;
6. Reduction of hospital costs to the majority of the people, giving the thrifty citizen the same assistance as the indigent;
7. Similar reduction in surgical costs by proper provision for the large group now classed as indigent.

At the 1933 annual meeting, the Committee dealt with the medical care of indigents:—"We recognize that in making these recommendations, we are suggesting a non-contributory form of State payment for medical care of indigent patients, but we maintain that, up to the present, this sort of arrangement has been in effect, the only difference being that, at present, the doctor has been doing the contributing and has received no payment in return."

Report on Questionnaire Regarding the Effect of the Depression on the Medical Profession, Hamilton, Ontario, 1933.

1. Volume of practice in 1932 compared to 1929. Average, 63.5 per cent.
2. 1929—Remunerative work, 77½ per cent; Unremunerative work, 22½ per cent. 1932—Remunerative work, 50 per cent; Unremunerative work, 50 per cent.
3. Professional income sufficient to pay expenses and provide bare living expenses. Yes, 50.6 per cent; No, 49.4 per cent. Average deficiency, 20.5 per cent.
4. Estimate of percentage of population able to pay for medical care:—
 - (a) Nothing—Average, 30-35 per cent;
 - (b) Half-tariff—Average, 30-35 per cent;
 - (c) Full tariff—Average, 30 per cent.
5. Patients who, owing to the depression, fail to secure medical care early for serious illness:—
 - (a) Remunerative—A few—37.5 per cent of members;
 - (b) Remunerative—Many—59.5 per cent of members;
 - (c) Remunerative—No delay—3 per cent of members;

- (a) Unremunerative—A few—49.2 per cent of members;
 - (b) Unremunerative—Many—47.8 per cent of members;
 - (c) Unremunerative—No delay—3 per cent of members;
6. Percentage of patients now unable to pay for medical care, previously belonging to the following economic classes:—
 - (a) Previously earning below \$25 per week—Average 60 per cent;
 - (b) Previously earning \$25 to 50 per week—Average 30 per cent;
 - (c) Previously earning over \$50 per week—Average 10 per cent.

QUEBEC

The Quebec Social Insurance Commission was appointed to consider certain subjects, including "social insurance:—old age insurance; unemployment insurance; sickness insurance; disability insurance; and all other problems of social insurance."

The Province of Quebec Medical Association appointed a special committee to study and report on Health Insurance. This was done, and the report submitted to the annual meeting, September, 1932. The report was referred to the constituent societies for consideration.

This report advocated a system of compulsory Health Insurance to cover a complete service and cash benefits, and the right of choice of physician. Unfortunately, there was not sufficient time to enable the profession to arrive at a final mutually agreeable plan. The following memorandum was submitted to the Commission.

"The preliminary report of September, 1932, issued by the Province of Quebec Medical Association, provoked much thought, discussion and suggestion on the part of the medical profession throughout the province. All district and urban societies, represented by delegate or by letter, are agreed upon the following general principles:—

1. The desirability—or even necessity—of providing 'Health Service' to the community of the province. This Health Service may be accomplished:—
 - (a) By Health Insurance—for those able to pay, in whole or in part, the premium for such insurance.
 - (b) By modification or enlargement of the scope of the Province of Quebec Charities Act, or L'Assistance Publique, whereby the organization in Province, County, or Municipality provide and pay for a Health Service for the indigent.
2. The organization of this Health Service should preserve intact the traditional personal relations between doctor and patient which in the past have been of such benefit to the community, namely:—
 - (a) 'Professional secrecy', which may be defined as a confidential relationship between patient and doctor, in which the patient may regard the doctor as his friend and adviser in any and all matters which may be revealed, and which binds the doctor to a trust.
 - (b) Freedom of choice of doctor by the patient, as at present exists, with similar freedom of change of doctor for cause.
 - (c) Freedom on the part of doctor of choice of treatment and prescription, provided that the British Pharmacopoeia and the French Codex are followed.

"It is impossible, with the information to hand, to get unanimity on details.

"But the medical profession are confident that after the Commission decide on general principles they will be able to assist greatly in arranging details.

(a) The maximum annual revenue of the group to which the privilege of health insurance will be extended will depend upon:—

1. The service to be rendered, and its cost. The medical profession feel strongly, as stated in the preliminary report, that this Health Service should be inclusive, namely:— medical attendance, hospitalization, nursing, drugs, et cetera, dental care and 'family cover'.

2. The premium required, and the proportion to be borne by the insured. In 'annual revenue' must be included not only cash (wages or salary), but revenue in kind.

The Montreal Medico-Chirurgical Society has expressed the opinion that the benefits of Health Insurance should apply to the small-salaried individual, and the small shopkeeper, et cetera, as well as to the employee of organized industry.

It may well be that the scheme at the outset will be restricted to organized industry, but the inclusive principle should be adopted in any recommendation.

(b) The method of remuneration of the doctor. There is strong sentiment among the profession for the adoption of the French plan of direct payment of the doctor by the patient, the patient choosing his doctor, paying the fee agreed upon, and being reimbursed by the Commission of Administration, according to the terms of the insurance contract.

Not only does this plan preserve the existing confidential relationship between patient and doctor, but it permits the extension of Health Insurance to all classes, irrespective of annual revenue, with necessary modification of the proportion of premium to be exacted from the insured.

It would also obviate the necessity of establishing a tariff—always a matter of contention and difficulty."

Quebec Social Insurance Commission, Seventh Report and Appendices to the Reports of the Commission, 1933.

Recommendations.

"Having considered the different aspects of the question, the Commission believe that it is advisable to attempt a partial solution by suggesting that here, as in Europe, the system may be adopted gradually. It is the opinion of the Commission that recourse should be had to the subsidized optional régime before the obligatory system.

"The Commission is of the opinion that a law should be passed . . . with a view to authorizing the formation of societies, such as the National Society for Hospital Treatment, which would accept contributions from employers and workers and receive a grant from the State, the amount to be determined according to the character of the society, i.e., county or urban. (The Society referred to has failed since the publication of the report, and is now a thing of the past).

"This régime which could be developed by careful publicity would, little by little, accustom the people to the idea of sickness insurance.

"As a result of this experience, the public authorities will be able to decide, after an interval of five years, whether it is advisable to institute obligatory insurance."

XXII.—COSTS OF MEDICAL CARE

INCOMES OF MEDICAL PRACTITIONERS

ONTARIO

"A survey of two districts in the Province of Ontario, covering about five hundred physicians, has been made. These districts comprise about eight counties and include a number of smaller cities.

"The average gross income, over a period of five years before 1930, was \$6,262.78.

"The average cost of carrying on a practice was \$2,924.46.

"The average amount of work done in a year for which no charge was made: \$814.82.

"The average amount of work done and charged which could not be collected was \$1,246.57.

"The average cost per family for individual care: \$45.29."

ALBERTA

"Some years ago, a survey was made of the Province of Alberta, when it was calculated that the average amount of free work done by all amounted to approximately \$2,000."

MANITOBA

MEDICAL SERVICE COMMITTEE, 1930

	Rural	Winnipeg General	Winnipeg Special	Total
Private Practice	\$5,010	\$6,523	\$11,368	\$6,588
Free Service ..	1,367	1,774	1,829	1,625
Hospital Service	264	770	3,672	962
Average Gross Income ...	6,641	9,067	16,869	9,175
Expenses of Practice ..	1,610	2,080	3,332	2,066
Net Income ...	5,031	6,987	13,537	7,109

BRITISH COLUMBIA

REPORT FROM A GROUP OF 66 DOCTORS IN VANCOUVER AND SUBURBS, 1923.

Gross Income	Number	Percentage	Average
0 to \$1,900	2	3	\$ 1,100
\$2,000 to 3,000	6	9	2,600
3,001 to 3,999	6	9	3,500
4,000 to 6,000	22	34	5,200
6,001 to 8,000	16	24	7,400
8,001 to 10,000	10	15	9,000
10,001 and over	4	6	18,100

COSTS OF MEDICAL SERVICE

MANITOBA

MEDICAL SERVICE COMMITTEE, 1930

Service	Per caput
Private Practice	4.97
Free Service	1.22
Hospital Service73
Physicians' total	6.92
General hospitalization	4.39
Nursing Services67
Per caput per year	\$11.98

(Medicines and dental care not included)

"On a basis of a family of five, our figures for private and institutional care show a cost of \$59.75 per rural family and \$93.90 per Greater Winnipeg family." (Includes \$11.90 for mental hospitals and homes for incurables).

COSTS OF PROPOSED PLANS FOR HEALTH INSURANCE

British Columbia Royal Commission

Plan A—employees only (maternity excluded)

156,380 employees with average morbidity of 7.18 days per year

	Total cost	Per caput cost
1,122,808 days at 84.47 for hospital..	\$948,435	\$6.06
1,122,808 days at 68.88 for doctors..	750,934	4.80
1,122,808 days at 13.73 for pharmaceutical supplies	154,161	.97
	\$1,853,530	\$11.83
10 per cent for administration		
2 per cent for reserve.....	222,423	1.42
	\$2,075,953	\$13.25
	\$1.10 per month per employee	

Plan B.

Employees only, including maternity benefit of \$25 to insured or wife of insured—\$1.24 per month per employee.

Plan C.

Employees and dependents, including maternity benefit of \$25—\$2.72 per month per caput.

Plan D.

Employees and dependents, including maternity costs but no cash maternity benefit—\$2.83 per month per caput.

Plan E.

Employees and dependents, including maternity costs and cash benefit of \$1.00 per day for time lost—\$3.48 per month per caput.

N.B.—Above plans do not include dental benefit or nursing care in the home.

Alberta Commission.

On page 36 of the Final Report, the following statement appears:—

Plan A—includes all the people of Alberta.

731,605, with average morbidity of 7.35 days per caput = 5,377,296 days.

	Total cost	Per caput cost
5,377,296 days at 66.83 for hospitals	\$3,593,647	\$4.91
5,377,296 days at 59.01 for doctors.	3,173,142	4.34
5,377,296 days at 13.57 for drugs..	729,699	.99
5,377,296 days at 27.88 for dentists.	1,499,190	2.05
Preventive care	475,800	.65
	\$9,471,478	\$12.94
10 per cent for administration....	947,147	
2 per cent for contingency reserve	189,429	1.56
	\$10,608,054	\$14.50

Per caput cost, \$14.50 per year, or \$1.21 per month.
Nursing costs (outside of hospitals) not included.

The bases of these estimates are set forth in the report as follows:—

Morbidity rates are based on the experience of the Geneva studies (League of Nations) and the rates used by insurance companies operating on this continent.

Hospital costs were determined by dividing the total days morbidity into the total hospital costs of the province (exclusive of provincial institutions).

Medical costs represent what was considered a fair average annual gross income for the medical practitioner, divided by the total days' morbidity.

The dental costs were estimated in the same way

Plan B—for employees only, exclusive of maternity, shows a cost of \$13.17 per caput per year.

SASKATCHEWAN

Report of Special Committee on a System of Health Insurance, Province of Saskatchewan Medical Association.

"In synthesizing the above data, we note that in small groups, the price per family would range in the neighbourhood of \$30; that as we increase the number of families, the cost would decrease, and when we consider the feature pertaining to municipalities, as is evidenced previously, the price of the hospitalization would be similar to the price of medical attention, so that if we were to take the price of hospitalization, divided by the number of municipalities, it would give an estimate which might show that where the municipalities are now paying \$4,500 to \$5,000 they might be paying less.

"Again, figuring on the hospital price which we have submitted, and figuring 560 doctors at \$5,000 each, we would have \$2,800,000 which is practically the same as hospitalization and would show a per capita rate, in all, of \$6.14, so that submitting \$30 per family were to cover the whole province, it would cover the whole health expenditure for all medical services."

PART THREE

THE CANADIAN MEDICAL ASSOCIATION'S PLAN FOR STATE HEALTH INSURANCE IN CANADA

XXIII.—GENERAL CONSIDERATIONS

Having pursued a study of the provisions of medical care in Canada, and with information at our disposal as to conditions prevailing in other countries, we now come to consider what might be done to bring about an improvement in the medical care received by the Canadian people.

The ultimate purpose of any plan for improvement is to make available for every Canadian the full benefits of curative and preventive medicine, irrespective of individual ability to pay, and, at the same time, to assure to the practitioners of medicine and others associated in the provision of medical care, a reasonable remuneration for their services.

Those who believe that the present method of providing medical care is adequate, or who hold the opinion that, with minor changes, it could be made adequate, will not be in favour of any fundamental changes.

Those who believe otherwise will agree that some definite change is required. This might be effected by:—

- (a) Medical service for certain groups, supported by contributions from those eligible to receive care, namely, health insurance;
- (b) Definite assumption by the State of full responsibility for the medical care of indigents;

- (c) Development of public health services to provide curative medical services for a large part of the population;
- (d) State medical service for all, supported by general taxation.

It does not follow necessarily that any contemplated change must be completed at its inception. There are good reasons for progressing slowly, in order to gain the untold benefits of experience in developing the complete plan.

Dissatisfaction with the present method of providing medical care is economic, because of the following:—

- (a) The expense is unwillingly incurred;
- (b) There is no set fee for a particular medical service;
- (c) The burden of costs is unevenly distributed;
- (d) It is impossible to budget for illness, because it is unpredictable as to time of occurrence, severity and costs;
- (e) The vast majority of wage-earners have no financial resources beyond their weekly earnings; the bulk of the population are wage-earners. Wealth is unevenly distributed.
- (f) Medical care, if properly given in the light of present-day knowledge, is beyond the reach of those of moderate means.

As the problem is essentially an economic one, attention is directed to the experience of those nations which have sought a solution of their similar problems through some form of health or sickness insurance.

The principle of health insurance is to shift the economic burden from the individual to the group. The insured contribute regularly to a fund out of which doctors' bills and other benefits are paid.

The Executive Committee of the Canadian Medical Association requested the Committee on Economics to prepare a Plan whereby the health insurance principle might be used in Canada to secure a better system of medical care for the Canadian people.

The Committee on Economics do not consider themselves competent to deal with all aspects of health insurance. The Plan submitted is primarily concerned with the medical services to be provided under a Plan of State Health Insurance. Consideration is given to organization, costs, et cetera, but, in these matters, the Committee on Economics does not wish to be thought of as doing anything more than offering suggestions, based upon a thorough study of the subject. With regard to medical services, the Committee feels that it is both the right and the responsibility of the Canadian Medical Association to speak with authority.

In matters of business arrangements for State Health Insurance, the lay power is supreme. The relationship is visualized as being similar to that which exists between the Board of Governors (lay) and the Medical Board (professional) of a hospital, which relationship, notwithstanding all its difficulties and problems, works very well. There is no better system to suggest unless a dictatorship is preferable.

The organized medical profession should accept their obvious responsibility to give leadership in the professional aspects of medical services. The organized medical profession has the right to expect that they will be consulted by any government considering health insurance or other similar legislation affecting the provision of medical care. That the medical profession should be consulted is in the public interest, because the public and the medical profession are mutually and equally interested in securing and maintaining a high standard of medical service. It is the public who would suffer from any lowering in the standards of medical care.

The medical profession holds a strategic position, because they have a monopoly of the knowledge con-

cerning the main field of service which it is the aim of health insurance to provide.

The Plan suggested is named State Health Insurance, as that name seems to describe it best. The Plan is not devised to meet an emergency situation, but rather to serve a stabilized economic condition in the future.

In this country, with the great differences which exist between industrial areas and sparsely-populated rural areas, it is obvious that it would be futile to outline a Plan which would be, in detail, adaptable to all areas. It should, however, be possible, and that is what has been attempted, to state general principles, leaving details of organization to those best acquainted with local conditions.

A Plan, just as well as an individual, can command respect if it is deserving of respect. The Plan is not the end, but a means to attain an end, and it is of importance only to the extent to which it achieves this purpose.

XXIV.—ADMINISTRATION

There would be many obvious advantages in a national plan. However, the Canadian situation is such that social insurance legislation, of which health insurance is a part, must be initiated by the provinces. The Dominion is free to make grants of money to the provinces adopting such legislation. This has been done in the matter of Old Age Pensions.

If one province were to undertake health insurance, and presuming that the industries in that province were required to contribute to the insurance fund established, it would follow that these industries would be handicapped in their competition with industries in other provinces which were not required to make contributions to a health insurance fund. Such a condition might lead to a migration of workers to those provinces where health insurance was in effect. These are but two considerations which illustrate the desirability of a Dominion-wide plan.

The Dominion could exercise considerable influence, if making such a grant, to secure the inclusion of the same desirable principles in all provincial legislation. The Dominion, if contributing, would give supervision through the Department of National Health. Practically, health insurance in Canada will be provincial in legislation, organization and administration.

A fair criticism of health insurance, as previously established, is that it has not been preventive in practice, and but little in outlook. The organized preventive and curative medical services should be fully co-ordinated and, for this reason alone, it appears essential that administrative responsibility for health insurance should be placed with the departments of public health.

There are many arguments in favour of having health insurance administered provincially by a Commission or Board, comparable to the present Workmen's Compensation Boards. Where this plan is favoured, a provincial Commission or Board would be established to administer health insurance. Workmen's compensation and public health might be placed under the same Commission or Board, but, in any case, the provincial health department should be the department used to provide the administrative machinery for health insurance, in order to link the organized curative and preventive medical services of the province.

In most provinces the provincial department of public health is at present responsible for the supervision or administration of institutions for medical care, whether these are supported in whole or in part out of public funds. This would provide a desirable link with the health insurance service.

Most, if not all provinces, have lacked a co-ordinated plan for hospital construction. The provinces should exercise, through their departments of public health, control in this matter, just as is now being done with

regard to the installation of water purification and sewerage disposal plants.

State Health Insurance would be organized as a division in the provincial department of public health. A Central Health Insurance Board would be appointed, representative of all interested parties, to act as an advisory board.

The provinces would be divided into local health insurance areas for purposes of health insurance administration. The local areas would be based upon one or upon a combination of several existing political administrative areas. The present county or rural health unit areas would appear to be desirable units for health insurance administration, and the two should be made to coincide.

The local department of public health (urban municipality or rural health unit) would be the administrative body for health insurance for the local area. The municipal or county council would appoint a Local Health Insurance Board, representative of all interested parties, to act as an advisory board in matters relating to health insurance.

It is of fundamental importance that the control of the professional side of the medical service should be placed in the hands of the organized medical profession. The Plan is to make the medical profession responsible for the quality of the medical service and for the discipline of their own members, as far as is practical.

Under the Plan would be appointed by the Provincial Medical Association, a Central Medical Services Committee, and by the medical association of each area, a Local Medical Services Committee to consider and advise on all matters related to the medical benefit, complaints as to medical service, et cetera.

If the Plan is to run smoothly and efficiently, the medical practitioners must find their conditions of service reasonably satisfactory. Experience has shown that this is best attained by giving responsibility to those who provide the service.

The supervision which would be required, the referee work which would naturally arise, should be provided by medical practitioners, as "regional officers" (later, one qualification for appointment should be experience in health insurance practice) on the staff of the provincial department of public health.

Medical practitioners are comparatively seldom given an opportunity to use their skill in keeping people well. Health supervision on an individual basis should be more effective than a health clinic service. The health clinic is not practical outside of the larger centres of population. The periodic health supervision of children and adults, together with pre-natal care, would be a part of the medical service given to individuals, under the Plan, by the general practitioner.

It is not enough to render lip service to the idea of prevention, and then leave it all to the public health worker. State Health Insurance must mean the systematic practice of preventive medicine by the health insurance medical practitioners, and assurance, in some manner, of periodic health examinations.

It is impossible to provide an adequate medical service without properly-organized departments of public health, which are lacking in many parts of Canada. The Province of Quebec recently passed a law which gives to the Province the right to order the establishment and maintenance of rural health units, and requiring the local areas to tax themselves for the maintenance of the units.

The Plan does not contemplate any disturbance of arrangements now generally accepted for providing certain medical services and institutional care through public health or other official departments. Experience has shown that certain diagnostic and treatment services can best be provided on a clinic basis.

It is desirable to encourage industries to establish and maintain health services. The Plan would be directly interested in such industrial health services because of

the preventive aspects of such services when properly conducted. Consideration should be given to the practicability of subsidizing industrial health services which conform to a given standard in preventive services, out of the health insurance fund.

The Plan defines the field of public health services as follows (presuming state health insurance medical services are provided):—

- (a) Vital Statistics;
- (b) Communicable Disease Control—
 1. Tuberculosis control—diagnosis, consultation, treatment;
 2. Venereal Disease control—diagnosis, consultation, treatment.
- (c) Cancer Control—diagnosis, consultation, treatment;
- (d) Mental Hygiene Clinics—diagnosis, consultation, treatment;
- (e) School Health Service;
- (f) Industrial Hygiene;
- (g) Milk and Food Control;
- (h) Public Health Laboratory Service;
- (i) Biological Products;
- (j) Public Health Engineering;
- (k) Sanitation and Housing;
- (l) Public Health Education.

NOTES: Tuberculosis, Venereal Disease and Mental Hygiene require the active participation of the public health nurse, working in and from the clinic to interpret environmental conditions to the physician, and to see that his instructions are carried out in the home. Clinics in these fields are regarded as essential in the program for prevention and control.

Perhaps the major activity of the department of public health would be the education of the public, leaving to the medical practitioner the responsibility for the health supervision of the individual, including smallpox vaccination, diphtheria immunization and periodic health examinations. He would, at the same time, stress the importance of health supervision for the preschool child.

School health services must be maintained as such, because the educational authority is responsible for protecting the health of children brought together under a compulsory school attendance act. They provide also an opportunity to deal with an organized group, and to maintain a check on the service received by these children before they reached school age.

It is worthy of note that the encroachments of public health which have been resented by medical practitioners have been into fields left unoccupied until the way was shown by the public health services.

The Plan supports the principle of a State Insurance Fund with the elimination of other insurance carriers. In no other way does it seem possible to avoid the conflicts between the insurance carrier and the medical profession, which have had such unfortunate results in many countries.

It is believed that two great assets in the British scheme are the local medical committees and the regional officers, while a great handicap is the insurance society which is primarily interested in protecting its funds through reducing the costs of medical care without regard to the quality of care provided.

The insurance fund should be provincial with no advantages to one area or to any group through irregularities or preferences in rates of benefits.

Principles.

1. That, in the provinces where state health insurance is established, it be administered by the departments of public health (whether or not under a Commission), in order to co-ordinate the organized preventive and curative medical services.

2. That a Central Health Insurance Board and Local Insurance Boards be appointed, representative of all interested, to advise the responsible administrative authority.
3. That the professional side of health insurance medical service be the responsibility of the organized medical profession through the appointment, by the medical societies, of a Central Medical Services Committee and Local Medical Services Committees to consider and advise on all questions affecting the administration of the medical benefit.
4. That local areas for health insurance administration correspond to urban municipalities and rural health unit areas.
5. That the whole province be served by adequate departments of public health, organized on the basis of individual health supervision by the health insurance general practitioner.
6. That there be a State Health Insurance Fund, provincially controlled, and that "regional officers", to act as supervisors and referees, be appointed, paid and controlled by the provincial department of public health.

XXV.—PERSONS INCLUDED IN THE PLAN

The medical care of the indigent is a responsibility of the State. There is no reason why the medical profession should alone bear the burden of providing one of the necessities of life—medical care—for the provision of which the State is responsible.

All the arguments advanced in favour of the insured having freedom of choice of doctor, and so forth, as being essential to good medical care, are equally valid for the indigent.

It is most undesirable to build up two organized medical services, the one for the insured, the other for the indigent. The Plan is to have one organized medical service for the insured and the indigent, the State paying the insurance premium of the indigent, and thus discharging an obligation, long overdue, to provide the indigent with medical care at the expense of the public as a whole.

The need for health insurance grows out of the inability of the individual or family to make economic provision for medical care.

The difficulty of setting an arbitrary amount as the income level above which no one is eligible to participate in the Plan grows out of the fact that the Plan is to provide a complete medical service. The income level must be relatively high so as to include those who could pay for a general practitioner service, but not for specialist or hospital services. It is against the severe or prolonged illness that a large number of individuals and families need protection.

The Committee on Economics realizes that income in kind, size of family, et cetera, are factors which have to be considered. Practically, a definite figure would likely have to be set, and the Plan suggests \$2,500 for a person with dependents, and \$1,200 for one without dependents.

Unless a plan is compulsory, it defeats the insurance principle of spreading the risk over the entire group. It is unfair to those who do insure to be called upon to share in the cost of caring for the irresponsible prodigal non-insured.

Since the object is to make medical care available to all, it follows that the dependents of the insured must be included in the medical benefit.

Hospital costs are a major factor in the economic problem of medical care, for those above the income level suggested. If, through group action, hospital costs could be spread, most of the group could take care of their other medical costs.

It is stated, by competent authorities, that for an annual premium of from \$6.00 to \$12.00, a benefit of 21 days' hospital costs can be provided. This period is sufficient for about 90 per cent of cases. The hospital benefit means private-room rates, and does not include medical care, special nursing, or extras.

Whether or not hospital care insurance should include surgeons' and other medical and nursing fees is a matter for consideration. There are obvious advantages in having the benefit take care of as much of the unusual and heavy costs as possible. The Canadian Medical Association has recently set up a special committee to study Group Hospitalization, and so provision has been made by the Association for a study which will lead to a report, to permit the Association to go on record as either approving or disapproving of the principle, and to endorse what should be included in the benefits provided.

In any event, it is not intended to make the hospital a medical centre with full-time medical staffs, but an institution to provide hospital facilities for the use of the general medical profession in the proper care of their patients.

Principles.

7. That medical care for indigents be provided under the Plan, the State to pay the premiums for the indigent, who then receive medical care under exactly the same conditions as the insured person.
8. That the Plan be compulsory for persons, with dependents, having an income of less than \$2,500 per annum; and for persons, without dependents, having an income of \$1,200 and less per annum.
9. That the dependents of insured persons be eligible for the medical benefit.
10. That there be offered, on a voluntary basis, to those with incomes above the Health Insurance level, Hospital Care Insurance, and that this be administered as part of the State Health Insurance Plan.

XXVI.—BENEFITS

It is most desirable to limit the benefits to one, namely, medical care, which it is the purpose of the Plan to make available to all.

It is true that the loss of income arising out of the illness of the bread-winner is a serious complicating factor. It is thought that unemployment insurance should cover unemployment arising out of illness in the same manner as it would insure against unemployment due to other causes.

The cash benefit is the cause of most of the difficulties associated with health insurance. It brings in the question of certification, it drains the fund financially, and, all told, makes administration and finance unduly difficult.

Certification for cash benefit, whether it be paid from health or unemployment insurance, is a problem which, in other countries, has been difficult of solution. The person best qualified to issue a certificate of illness is the doctor in charge of the case, but as he is actuated by a desire not to offend his patient, the "regional officer" would include in his duties the systematic supervision of certification, if such be required.

Medical Benefit.

It is desirable to emphasize, through reiteration, that mass methods are not applicable to medical care, because medical care is the care given to an individual who is sick, and as neither individuals nor illnesses are ever exactly alike, they cannot be treated by mass or routine procedures.

The general practitioner can give adequate and satisfactory medical care to upwards of 80 per cent of all those requiring it. It follows that the Plan for medical benefit is based upon making available the services of a general practitioner to all. It would be

the general practitioner who would provide regular health supervision for those being cared for under the Plan.

It is altogether likely that the old-time family doctor has passed, and that he will be replaced by a general practitioner. This may appear to be a quibble in terms, but it implies a change in the type of service. The passing of the family doctor is due, in some measure, to advances in medicine beyond the acquirement of personal skills.

Specialism has modified medical practice. Partially or wholly, temporarily or permanently, some branch of modern medicine is restricted to the specialist, and the general practitioner finds himself consulting specialists more frequently in the interests of his patients.

It is in the public interest to develop a high quality of general practitioner service. The best of the old relationship can be preserved by allowing for the free choice of doctor. Freedom of choice is essential if the patient is to have that confidence in his doctor which is such a valuable element in medical treatment. Free choice means competitive practice, which, as it tends to maintain standards of service, is most desirable, within limitations.

In order that freedom of choice may be a reality, the Plan is that every qualified, licensed medical practitioner be eligible to practise under the Plan.

Under the Plan, a large part of the practice of medicine would be organized under State supervision. Consideration should be given to the number of medical practitioners required to provide the medical services. It seems reasonable that some control should be exercised over the numbers of students admitted to medical schools.

To a considerable extent, the cost of medical education is borne by the State or by private philanthropy. It is a waste of money and of human lives to train men and women for a service which cannot absorb them.

It should not be assumed that there are too many medical practitioners. When the economic barrier is removed through the Plan, and when general practitioners engage in the practice of preventive medicine under the Plan, the numbers required will be found to be much greater than has been considered adequate in the past.

To emphasize the rightful and important place of the general practitioner is not to minimize the value of the medical specialist and consultant. The general practitioner will call for the services of specialist and consultant to assist in problems of diagnosis and treatment, and, in certain cases, to provide the therapy required.

The individual lay person is not competent to decide when specialist services are required, or where such service can best be found. It is wasteful of time and money, and it is not conducive to the best service to make use of specialist services when the general practitioner could give the medical care required.

If the general practitioner is to secure the best care for his patient, no economic barrier must be imposed to prevent his patient from having specialist and other service, when, in the opinion of the general practitioner, care of this type is indicated.

It follows that there must be some system whereby specialists and consultants are to be designated. It is most desirable to have a uniform procedure for all of Canada. Whatever may be done by the provinces temporarily, the Plan is to have Fellowship in The Royal College of Physicians and Surgeons of Canada accepted by all provinces as the qualification for a specialist.

A consultant need not be a specialist. He may be a general practitioner who has attained the standing of consultant through recognition by his fellow-practitioners.

The relationship of oral conditions to the general health is well recognized. It would be futile to attempt to supervise and maintain health, or treat disease adequately without having available a dental service.

In the care of the sick, nursing service is often an essential part of treatment. Nursing care in the home is now provided by private-duty nurses, or by visiting-

nurse organizations. The latter give their service on a visit basis, which is a satisfactory and economical method of providing most of the home bedside nursing care needed. The Plan is that those requiring full-time nursing care should be admitted to hospital, and that nursing care in the home be limited to a visiting-nurse service, including maternity service, provided preferably by a local branch of the Victorian Order of Nurses for Canada, a national visiting-nurse organization, with local branches so located that they now offer their services to one-third of the population of Canada.

When the services of a pharmacist are available, they should be used. In certain places, the medical practitioners will have to do their own dispensing.

Additional auxiliary service should be available, upon request of the medical practitioners. Practically, these should be almost limited to hospitals. It would not be possible to provide these services to a scattered population in their own homes.

Institutional care should be provided upon requisition of the medical practitioners. No change in hospital management is contemplated. The hospital, whether municipal or private, would be paid, at certain rates, for the hospital care of the insured.

In order to make hospital care available, county or rural municipal hospitals, providing a limited service, will be required. Larger hospitals, providing a more complete service, would be placed throughout the province, and to these, patients could be cleared from the smaller hospitals. One or more central general hospitals, providing a complete service, would serve the whole province. Hospital construction would be planned, according to needs, and special hospitals would be built as a need for these became evident. The Plan does not contemplate that the Insurance Fund would assume any responsibility for hospital construction; it would provide only for the hospital maintenance of the insured.

The general practitioner should be able to follow his patient into hospital. The only practical system for the central hospitals, which are used for teaching, is the closed staff.

Principles.

11. That the only benefit under the Plan be the medical benefit;
12. That the medical benefit be organized as follows:
 - (a) Every qualified licensed practitioner to be eligible to practise under the Plan;
 - (b) The insured person to have freedom of choice of general practitioner;
 - (c) The medical service to be based upon making available to all a general practitioner service for health supervision and the treatment of disease;
 - (d) Additional services to be secured normally through the general practitioner—
 - (1) Specialist and consultant medical service (only those so designated to be eligible to practise as specialist and consultant);
 - (2) Visiting-nurse service in the home;
 - (3) Hospital care;
 - (4) Auxiliary services—usually in hospital;
 - (5) Pharmaceutical service.
 - (e) Dental service, arranged direct with dentist or upon reference.

XXVII.—CONTRIBUTIONS TO THE INSURANCE FUND

Contributions to the Insurance Fund are secured from the insured in one of the following ways:—

- (a) Deduction from wages—wage tax;
- (b) Tax:
 - (1) on land;
 - (2) per caput.

There are strong arguments in favour of the payment of the contribution or premiums in such a manner that the insured realizes that he is paying for a service. This encourages thrift and sense of personal responsibility.

The worker on salary or wage can make a regular contribution by having his premium deducted from his wages each pay day.

In rural areas, a tax on land for land-owners appears to be the most practical method. For urban employers below the income level, and for non-land-owners in rural areas, a per caput tax is the most feasible method.

The Committee on Economies is not directly concerned as to the method used to collect premiums. It is necessary that the costs be spread widely if the Plan is to work. It appears reasonable that, under our present social system, those with higher wages should make a proportionately higher contribution. If the tax on wages were fixed at a given percentage, this would be accomplished.

At present, the individual pays for education and other services through taxation, based, presumably, on his capacity to pay. There is no difference in the service rendered because contributions have varied, nor is there any suggestion of charity. The same principle should apply to State Health Insurance.

It is reasonable for the employer to contribute to the Insurance Fund, as he has a direct interest in the physical and mental health of his employees, their efficiency being influenced by their health.

The State is interested in the health of the people, and just as the State makes contributions to education out of general taxes, so might the State logically contribute to the Insurance Fund out of general taxes.

In general, the insured should make the largest and the State the smallest contribution to the Insurance fund.

Principle.

13. That the Insurance Fund should receive contributions from the insured, the employers of the insured, and the State.

XXVIII.—COSTS

The Committee on the Costs of Medical Care stated that all needed care, including services of physicians and dentists, hospitalization, drugs, eyeglasses, et cetera, could be provided to groups of the population at a cost of from \$20.00 to \$40.00 per caput per annum.

British Columbia (Plan D) estimate, for doctors, hospitals and drugs, the cost to be \$33.91 per caput per annum.

Alberta (Plan A) estimate, for hospitals, doctors, drugs, dentists, and preventive care, the cost at \$14.50 per caput per annum. (Costs of nursing care at home not included).

The British Columbia plan is for employees and their dependents, while that of Alberta is for all the people of that province. Alberta estimates its hospital costs very much lower and its medical costs definitely lower than does British Columbia.

It is unsound to base future costs upon what is now being expended on medical care. Under the present system many go without care, or receive inadequate care, and there is but little preventive service given by the general practitioners. There is no doubt that the public need more service than they now receive.

Despite what may be said as to the need for a complete service, it is not to be forgotten that it is the public who, as the consumers, have to decide what they are prepared to pay for. It is not the responsibility of the medical profession to attempt to force upon the public a service for which the people are unwilling to pay, nor is it the responsibility of the

medical profession to provide service which the public are able, but unwilling, to pay for. However, the medical profession should not, by opposing the Plan, seek to deprive the public of medical service for which the public are willing to pay through State Health Insurance.

XXIX.—PAYMENT OF MEDICAL PRACTITIONERS

Medical service must be adequately paid for, otherwise the service inevitably is scamped. The general principle of payment on the basis of service rendered receives universal support. In those areas where there is not a sufficient population to maintain even one general practitioner, it is apparent that it will be necessary to guarantee to the medical practitioner who locates in such an area, a certain income. This amounts to a salary paid on a contract basis. In order to protect the medical practitioner and the public in such cases the contract should be made and approved through the provincial department of public health, which department will be responsible, under the Plan, for the quality of service rendered. In the areas just referred to, free choice of doctor cannot be practised, because only one doctor is available. The salary-contract type of practice should be limited to these areas. In other localities, the practice of medicine should continue much as it is today, with free choice of doctor, the only real difference being that under the Plan the doctor will be paid by the Insurance Fund instead of by the individual.

The Insurance Fund will be a central fund collected from all over the province. Those areas with a small population will have to be allocated sufficient to maintain a doctor in their area. This is part of the Plan to spread the costs of medical care over the province. The Insurance Fund would be divided presumably upon the basis of anticipated expenditures for the various items of the medical benefit. This means that a certain sum will be available to pay the medical practitioners.

In reasonably large groups, the morbidity rates are fairly uniform, so that the amounts to be allocated for medical practitioners' services in the different local areas could be fairly approximated on the basis of equalized morbidity rates. If special allowances are to be made to medical practitioners for transportation and other special costs in rural areas these must be provided for, but after all deductions, there is a sum of money for the payment of medical practitioners in each area.

There does not appear to be any reason why a uniform system of payment should be advocated. It seems much more reasonable to allow the medical practitioners of each area to choose which system they desire to use. There is a sum for distribution; the method used will neither decrease nor increase it, otherwise the fund would not be solvent.

The Central Medical Services Committee of the province will be responsible to decide for the province the relationship which is to exist between specialist and general practitioner fees, and between medical and surgical fees. Obviously, this must be determined on a provincial rather than on a local basis, because in many cases the patient will leave the local area for specialist, surgical and hospital care.

Arguments are advanced in favour of requiring some payment by the insured for each illness, to prevent abuse of the medical benefit. This is not viewed sympathetically, because the main objective is to remove any economic barrier which now keeps doctor and patient apart. It is suggested that the so-called "neurasthenic" requires treatment just as much as does the physically-ill patient, and if such cases are beyond the capacity of the general practitioner they should be referred to the psychiatrist for care.

The suggestion that the insured should pay some part of the cost of medicines is viewed with favour, as this might discourage the unnecessary use of medi-

cines, and bring the patient to accept hygienic advice rather than to seek health in a bottle of medicine. In the case of indigents the entire cost of medicines would, of necessity, be paid out of the Insurance Fund.

It appears reasonable that a health examination should be a requirement, within a given period, after an insured person has selected his general practitioner.

Principles.

14. That the medical practitioners of each local area be remunerated according to the method of payment which they select.
15. That the Central Medical Services Committee decide the relationship between specialist and general practitioner fees, and between medical and surgical fees.
16. That contract-salary service be limited to areas with a population insufficient to maintain a general practitioner in the area without additional support from the Insurance Fund.
17. That no economic barrier be imposed between doctor and patient, but that the insured be required to pay a part of the cost of medicines.

XXX.—GENERAL OUTLINE OF PLAN FOR STATE HEALTH INSURANCE IN CANADA

Purpose.

The ultimate purpose of any plan is to make available for every Canadian the full benefits of curative and preventive medicine, irrespective of individual ability to pay, and, at the same time, to assure the practitioners of medicine and others associated in the provision of medical care a reasonable remuneration for their services.

I. Administration.

1. Central: Provincial Department of Public Health:
 - (a) Central Health Insurance Board; advisory.
 - (b) Central Medical Services Committee; advisory.
 - (c) Regional Officers; supervisors and referees.
2. Local: Local Department of Public Health:
 - (a) Local Health Insurance Board; advisory.
 - (b) Local Medical Services Committee; advisory.

NOTE:—Such other similar central or local committees as may be deemed necessary to represent other bodies rendering service under the medical benefit.

II. Persons included in the Plan.

1. Compulsory and Contributory:
 - (a) Persons, with dependents, having an annual income of less than \$2,500;
 - (b) Persons, without dependents, having an annual income of \$1,200 or less;
 - (c) Indigents—premiums paid by the State;
 - (d) Dependents of (a), (b) and (c).
2. Voluntary—Hospital Care Insurance:
 - (a) Those with incomes above the limit of "1" above.

III. Benefits.

1. For compulsory contributors and indigents:
 - (a) Every qualified licensed practitioner entitled to practise under the plan;
 - (b) Freedom of choice of general practitioner by insured;
 - (c) A general practitioner service for health supervision and the treatment of disease;
 - (d) Services to be secured through general practitioner;

- (1) Specialist and consultant medical service;
- (2) Visiting-nurse service in the home;
- (3) Hospital care;
- (4) Auxiliary services—usually in hospital;
- (5) Pharmaceutical service.

(e) Dental service.

2. For voluntary contributors to Hospital Care Insurance:

- (a) Payment to hospital for private-patient accommodation for twenty-one days during the year. Medical care, special nursing, and extras not included.

IV. Contributions to the Insurance Fund.

1. Wage-earners and salaried employees to pay a wage tax.
2. Rural landowners to pay a land tax.
3. Rural non-landowners and urban employers to pay a per caput tax.
4. Employers of insured to contribute.
5. State to contribute.

V. Payment to Medical Practitioners.

1. The medical practitioners of each local area to determine method of payment for their area.
2. The Central Medical Services Committee to determine specialist, surgical and other medical fees.
3. Contract-salary practice limited to sparsely-populated areas which require additional help from Insurance Fund to maintain a general practitioner in their area.

VI. Public Health Services (not provided by Insurance Fund).

1. Vital Statistics;
2. Communicable Disease Control:
 - (a) Tuberculosis Clinics;
 - (b) Venereal Disease Clinics.
3. Cancer Control Clinics;
4. Mental Hygiene Clinics;
5. School Health Service;
6. Industrial Hygiene;
7. Milk and Food Control;
8. Public Health Laboratory Service;
9. Biological Products;
10. Public Health Engineering;
11. Sanitation and Housing;
12. Public Health Education.

VII. Related Services (not provided by Insurance Fund).

1. Mental Hospitals;
2. Tuberculosis Sanatoria;
3. Workmen's Compensation (may be part of Health Insurance);
4. Construction of hospitals.

XXXI.—ENUMERATION OF PRINCIPLES

1. That in the provinces where state health insurance is established it be administered by the Departments of Public Health (whether or not under a Commission) in order to co-ordinate the organized preventive and curative medical services.
2. That a Central Health Insurance Board and Local Insurance Boards be appointed, representative of all interested, to advise the responsible administrative authority.
3. That the professional side of health insurance medical service be the responsibility of the organized medical profession through the appointment, by the medical societies, of a Central Medical Services Committee and Local Medical Services Committees to consider and advise on all questions affecting the administration of the medical benefit.

4. That local areas for health insurance administration correspond to urban municipalities and rural health unit areas.
5. That the whole province be served by adequate departments of public health, organized on the basis of provision of individual health supervision by the health insurance general practitioner.
6. That there be a State Health Insurance Fund, provincially controlled, and that "Regional Officers", to act as supervisors and referees, be appointed, paid and controlled by the provincial department of Public Health.
7. That medical care for indigents be provided under the Plan, the State to pay the premiums of the indigent, who then receive medical care under exactly the same conditions as the insured person.
8. That the Plan be compulsory for persons, with dependents, having an income of less than \$2,500 per annum; and for persons, without dependents, having an income of \$1,200 and less per annum.
9. That the dependents of insured persons be eligible for the medical benefit.
10. That there be offered, on a voluntary basis, to those with incomes above the health insurance level Hospital Care Insurance, and that this be administered as part of the State Health Insurance Plan.
11. That the only benefit under the Plan be the medical benefit.
12. That the medical benefit be organized as follows:
 - (a) Every qualified licensed practitioner to be eligible to practise under the Plan;
 - (b) The insured person to have freedom of choice of general practitioner;
 - (c) The medical service to be based upon making available to all a general practitioner service for health supervision and the treatment of disease;
 - (d) Additional services to be secured normally through the general practitioner:
 - (1) Specialist and consultant medical service (only those so designated to be eligible to practise as specialist and consultant);
 - (2) Visiting-nurse service in the home;
 - (3) Hospital care;
 - (4) Auxiliary services—usually in hospital;
 - (5) Pharmaceutical service.
 - (e) Dental service, arranged direct with dentist or upon reference.
13. That the Insurance Fund should receive contributions from the insured, the employers of the insured, and the State.
14. That the medical practitioners of each local area be remunerated according to the method of payment which they select.
15. That the Central Medical Services Committee decide the relationship between specialist and general practitioner fees, and between medical and surgical fees.
16. That contract-salary service be limited to areas with a population insufficient to maintain a general practitioner in the area without additional support from the Insurance Fund.
17. That no economic barrier be imposed between doctor and patient, but that the insured be required to pay a part of the cost of medicines.

All of which is respectfully submitted,

W. HARVEY SMITH,
Chairman.

A. GRANT FLEMING,
Secretary.

BIBLIOGRAPHY ON HEALTH INSURANCE

Progress Report of the Royal Commission on State Health Insurance and Maternity Benefits—presented to the Legislature of British Columbia, 1930.

Final Report, British Columbia, 1932.

Report of the Enquiry into Systems of State Medicine, Province of Alberta, 1929.

Progress Report of the Commission appointed to (a) Consider and make recommendations to the next Session of the Legislature as to the best method of making adequate medical and health services available to all the people of Alberta, and (b) Report as to the financial arrangements which will be required on an actuarial basis to ensure the same, 1933.

Final Report of the Legislative Commission, Alberta, 1934.

Submissions to the Commission, Alberta, 1932.

Some Aspects of Preventive Medicine, J. G. Fitz-Gerald, Toronto, 1928 (Gordon Bell Memorial Lecture).

Report of the Inter-Relations Committee of the Ontario Medical Association, (1930-1934).

On the State of the Public Health—Annual Reports of the Chief Medical Officer of the Ministry of Health for the years 1923 to 1932 (inclusive), England and Wales.

The British Medical Association's Proposals for a General Medical Service for the Nation, 1930.

National Health Insurance in England, Alfred Cox.

Memorandum on the English Scheme of National Health Insurance, with Special Reference to its Medical Aspects—G. F. McCleary, Medical Officer of the Ministry of Health, London, England, 1930.

National Health Insurance Medical Benefit Amendment Regulations, England, 1929.

Report of the Royal Commission on National Health Insurance, England.

The Statutes, Regulations and Orders Relating to National Health Insurance, England.

Medical Insurance Practice, R. W. Harris and Leonard Shooten Sack. (Issued by the British Medical Association).

Method of Distributing Practitioners' Fund, England. Allocation Sub-Committee, England.

Sickness Insurance, W. C. Rappleye, Director of the Study Commission on Medical Education, New Haven, Conn.

Some problems of Medical Service, W. C. Rappleye, 1930.

Reports (complete) issued by the Committee on the Costs of Medical Care, Washington, D.C., 1928-1932.

Medical Care for the American People, Final Report of the Committee on the Costs of Medical Care, 1932.

Handbook of health Insurance, State Medicine and the Cost of Medical Care, Issued by the American Medical Association.

Voluntary Sickness Insurance, International Labour Bureau, Geneva, 1927.

Compulsory Sickness Insurance, International Labour Bureau, Geneva, 1927.

Report of the Royal Commission on Public Welfare, Ontario, 1930.

Outline of Proposed System of State Health Insurance for British Columbia, Stanley Clark, 1924.

Report of the Medical Service Committee, Manitoba, 1931.

Revue Internationale de Médecine Professionnelle et Sociale, August, 1931.

The Real Meaning of Social Insurance, Wolfenden, 1932.

A Study of Sickness Cost and Private Medical Practice, Donald B. Armstrong, 1932.

Report of the Committee for the Study of Social Insurance (Health Insurance), Province of Quebec Medical Association, 1932.

The Cost of Medical Care, Lec K. Frankel. (Metropolitan Life Insurance Company), 1929.

State Regulation of the Practice of Medicine, F. R. Green, (American Medical Association), 1919.

Select Standing Committee on Industrial and Inter-

national Relations, House of Commons, Canada, 1928.

Select Standing Committee on Industrial and International Relations, House of Commons, Canada, 1929.

House of Commons Debates (State Medicine), Canada, April 27, 1931.

Health, Health Insurance, Old Age Pensions. The Ohio Health and Old Age Insurance Commission, 1919.

Social Insurance, Report of the Special Committee, American Medical Association, 1919.

An Address on Sickness Insurance, John W. S. McCullough, Toronto, Canadian Medical Association Journal, 1929.

Facts and Fallacies of Compulsory Health Insurance, Frederick L. Hoffman, 1917.

The Way of Health Insurance, A. M. Simons and Nathan Sinai, 1932.

State Medicine Abroad and its Relation to Hospitals, Corwin and Davis, Transactions American Hospital Association, 1931.

The Municipal Physician System in Operation in the Provinces of Manitoba and Saskatchewan, J. G. Fitzgerald, Supplement to the University of Toronto Monthly, 1932.

Memorandum presented by Roderic Olzendam, Social Insurance Research Director of the Metropolitan Life Insurance Company, at the invitation of the Joint Legislative Committee on Unemployment of the State of New York, 1932.

The Possible Effect of Health Insurance Upon our Hospitals, G. Harvey Agnew, Bulletin American Hospital Association, October, 1931.

Essentials of a National Medical Service, Sir Henry Brackenbury, (British Medical Journal, March 4, 1933).

Income from Medical Practice, R. G. Leland (A.M.A.), 1931.

What Shall be the Attitude of the Physician toward Insurance Plans? J. Milton Robb, (A.M.A. Bulletin, January, 1933).

Oikonomia Medika, Samuel G. Harvey, Yale Journal of Biology and Medicine, March, 1933.

National Health Insurance, G. F. McCleary, 1932.

International Studies—Prevention and Treatment of Disease, 3 volumes, Sir Arthur Newsholme, 1931.

Medicine and the State, Sir Arthur Newsholme, 1932.

Reports, Quebec Social Insurance Commission, 1931-1933.

Monograph Series on Social Insurance, Metropolitan Life Insurance Company, numbers 1 to 13 (inc.), 1931, 1932.

Paying Your Sickness Bills, Michael Davis, 1931.

The Purchase of Medical Care Through Fixed Periodic Payment, Williams, 1932.

The British System of Social Insurance, Percy Cohen, 1932.

Public Health and Insurance, Sir Arthur Newsholme, 1920.

The State and the Doctor, Webb, 1910.

A Cure for Doctors' Bills (Atlantic Monthly), Evans Clark, 1930.

How Shall the Doctor be Paid? Survey Graphic, January, 1930.

Health Insurance, J. H. MacDermot, Canadian Medical Association Journal, 1929.

Red Medicine, Sir Arthur Newsholme and John Adams Kingsbury, 1933.

The Prevention of Destitution, Sydney and Beatrice Webb, 1920.

How to Budget Health, Evans Clark, 1933.

Mutual Health Service, Supplement to Journal Michigan State Medical Society, May, 1934.

The Medical Profession and the Public, Joint Meeting of the College of Physicians of Philadelphia and the American Academy of Political and Social Science, February, 1931.

Medical Education and Related problems in Europe, Commission on Medical Education, 1930, and Final Report, 1932.

Proposals for a Free Socialist Medical Service. The

Medical Officer, June, 1932.

First, Second and Third Reports of the Commission on Old Age Pensions and National Insurance, Union of South Africa, 1927-1929.

Publications of the Dominion Bureau of Statistics, Seventh Census of Canada, 1931.

Is the Nationalization of the Medical Profession Desirable? J. Heurner Mullin, 1923.

Publication of the Department of Trade and Commerce, Incomes Assessed for Income War Tax in Canada, 1932.

The Canada Year Book, 1926-1932.

Occupational Disease Legislation, American Public Health Association, 1931.

Hospital Care in the Family Budget, C. Rufus Rorem, American Hospital Association Bulletin, 1933.

Health Insurance in England, Sir Henry B. Brackenbury, New England Journal of Medicine, April, 1934.

Socialized Medicine, Bengt Atlee, Saskatchewan C. C. F. Research, April, 1934.

The Union Hospital System in Saskatchewan, F. C. Middleton, Child and Family Welfare, January, 1934.

Wages and Hours of Labour in Canada, 1930, 1931 and 1932, supplement to the Labour Gazette, January, 1933.

Saskatchewan Medical Association, Report of Annual Meeting, September, 1932, and Special General Meeting, February, 1933.

Federal Emergency Relief Administration, Governing Medical Care provided in the home to recipients of Unemployment Relief, Rules and Regulations No. 7, U. S. Government Printing Office, 1933.

Adult Diseases in an Industrial Population, R. Vance Ward, Canadian Public Health Journal, September, 1932.

What is wrong with National Health Insurance? Presidential Address of Sir Henry Brackenbury to section of Preventive Medicine, B.M.A., 1933.

Report of the Committee on Survey of Medical Services and Health Agencies, Michigan State Medical Society, 1933.

A Critical Analysis of Sickness Insurance, Preliminary Report of the Bureau of Medical Economics, American Medical Health Association Bulletin, April, 1934.

Canadian Medical Association Journal, section on Medical Economics, 1933-1934.

Municipal Hospitals in Alberta, W. B. Milne, Child and Family Welfare, March, 1934.

In discussing this report, the following points were brought out:—

“Would favour health insurance being administered by a Commission with medical men in control. Not in favour of the Departments of Public Health taking control”.

“Would call attention to the importance of every qualified medical practitioner being included in any plan that may be established”.

“Every doctor working under the plan shall be paid a reasonable wage for services rendered. He should not be looked upon as a public servant liable to be shifted about with each change of Government”.

“The purpose of any plan is to make available for every Canadian the full benefits of curative and preventive medicine irrespective of individual ability to pay, and, at the same time, to assure the practitioners of medicine and others associated in the provision of medical care a reasonable remuneration for their services”.

“It is important that the medical practitioners of each local area should determine the method of payment for their area”.

“Attention was called to the importance of preventive medicine. Prevention is possibly more important

than cure. If we are practising preventive medicine in a satisfactory manner more doctors will be required”.

“Doctors should endeavour to improve their standing by taking certain examinations, and payment should be made on the basis of qualification. Some plan for the accomplishment of this should be established for the whole of Canada, each province adapting the general principles to their local conditions”.

“Any plan of health insurance should supply medical care to all the people. They should be allowed to retain choice of physician to the same extent as they have it today”.

“Provision should be made for a yearly vacation for each doctor; also an opportunity to take post-graduate work at some large centre”.

“Fees paid should be adequate to provide a reserve fund which would take care of them in old age”.

“In the machinery established to carry out any plan there should be both a professional and a lay Board, to act in an advisory capacity. The medical profession should be organized by itself, with its own officers, and that central body should negotiate the financial side of the plan with the lay people”.

“The Committee has asked for suggestions from the Provincial Associations in order that the report may be amended to meet the wishes of these Associations. The report should now be referred to the Provincial Associations for further consideration, asking them to forward their suggestions to the Secretary”.

“It is provided in the plan that the insured shall have a choice of general practitioner. There is no provision for choice of specialists. It must be recognized that there are certain evils existing in the present system of practice. One is the practice of fee-splitting; and if the insured is to have nothing to say with regard to the specialist to be selected then the old habit of fee-splitting will be perpetuated without any check”.

“Would like to see the District Meetings consider this report in the Autumn and get it back to the Canadian Medical Association before the Legislature meets”.

“*Question.*—When will this report be considered by the Canadian Medical Association after having been considered by the Provincial Associations?”

“*Reply.*—I do not think any one can answer that. I would think that when the comments come back and are dealt with by the Committee on Economics it may be found that the report may be redrafted to meet the expressed wishes of the provinces without very much delay”.

“Any plan that may be adopted will be put forward by some Government. The first scheme will be a provincial one. Supposing we are successful in having the Canadian Medical Association and the Provincial Associations agree on principles, in the last analysis action will have to be taken by a Provincial Association. The medical profession will have to act through the agency of the Provincial Association. What Council has done is to send forth a wonderful compilation of the subject, with certain principles which the Committee has more or less agreed upon. The Canadian Medical Association may take action on the various comments of the Provincial Associations at the next annual meeting, but, before that time, there may be action by some Province. This report will be of great value to any Provincial Association which may have to deal with projected provincial legislation”.

“Personally, I am not in favour of any change in our present system in Ontario. I do not think there is a great demand for any change, although there is in some of the provinces. If the Government wants health insurance let them have it under unemploy-

ment insurance. Our hope will be that every practitioner will become a Medical Officer of Health”.

“I do not see why I, as a member of this Council, should try to say to any other Province what scheme they should have. Conditions in the different provinces are so very different. While it may be of value to all provinces to have this report, I do not think we should send it on to them and tell them it is the thing to suit their needs. The Federal Government has no right to put forward any such proposal. If this report is printed and sent to all the Associations in order to let them have the benefit of whatever is in it I do not think there is much more we can do. It is true that there are certain principles such as free choice of doctor and adequate pay for doctors, but there are many things which some might find good and others might consider not so good. Supposing this is brought up again next year and adopted, it will still be something which is merely a matter of information for the provinces. I think we shall have served our purpose when we pass the data on to the various provinces of Canada for their information and guidance”.

It was then duly moved, seconded, and agreed that the report of the Committee on Economics be received; and that it be referred to all the Provincial Medical Associations, with the request that these Associations forward to the General Secretary any suggestions as to modifications of the principles set forth in the report, before January 1, 1935; and that the Executive Committee then re-draft the report before submission to Council in the light of the expressed views of the Provinces.

CHAIRMEN OF COMMITTEES

Council instructed the Executive Committee to deal with all matters of business arising from the annual meeting. The Executive Committee appointed the following Chairmen of Committees:—

Archives.—Dr. C. F. Wylde, Montreal.

Study Committee on Cancer.—Dr. A. Primrose, Toronto.

Constitution and By-Laws.—Dr. Geo. S. Young, Toronto.

Economics.—Dr. W. Harvey Smith, Winnipeg.

Credentials and Ethics.—Dr. J. D. Adamson, Winnipeg.

Group Hospitalization.—Dr. F. W. Routley, Toronto.

Advisory Committee to Department of Hospital Service.

—Dr. A. K. Haywood, Vancouver.

Inter-Provincial Relations.—Dr. G. A. B. Addy, Saint John.

Legislation.—Dr. G. D. Stanley, Ottawa and Calgary.

Maternal Welfare.—Dr. W. B. Hendry, Toronto.

Medical Education.—Dr. E. S. Ryerson, Toronto.

Meyers Memorial.—Dr. J. T. Fotheringham, Toronto.

Orations.—Dr. J. C. Meakins, Montreal.

Osler Memorial.—Dr. Campbell Howard, Montreal.

Pharmacy.—Dr. V. E. Henderson, Toronto.

Post-graduate and Central Program Committees.—Dr. Geo. S. Young, Toronto.

Public Health and Medical Publicity.—Dr. J. G. Fitz-Gerald, Toronto.

Royal College of Surgeons of England.—Dr. A. Primrose, Toronto.

Study Committee on Nursing of the Canadian Medical Association and Canadian Nurses' Association

(*Medical Representatives*).—Drs. G. Stewart Cameron, Peterborough; J. C. Meakins, Montreal; Duncan Graham, Toronto; G. Harvey Agnew, Toronto.
Committee on Hospital Internships.—Drs. F. S. Patch, Montreal; G. F. Stephens, Winnipeg; A. K. Haywood, Vancouver; J. J. Ower, Edmonton; G. Harvey Agnew, Toronto.

MESSAGE FROM THE PRINCE OF WALES

The following cable was sent to His Royal Highness, the Prince of Wales, Patron of the Association:—

“The Canadian Medical Association assembled sixty-fifth annual session, Calgary, extends heartiest birthday greetings to your Royal Highness, our honoured patron. Your ranch centre of great attraction to visitors.”

The following reply was received from His Royal Highness:—

“Please convey my grateful thanks to members Canadian Medical Association for their kind birthday congratulations. I wish all success to this year's session.”
 EDWARD P.

B.M.A. MEETING—MELBOURNE, 1935

Attention was called to the fact that the British Medical Association is planning to meet in Melbourne, Australia, during the week of September 9, 1935. As some of our Canadian Medical Association members might be interested in attending this meeting and making a “Round-the-World” tour, the Editor was instructed to publish all available information in the *Journal*.

ELECTIONS

The following were elected to office:—

President.—Dr. J. S. McEachern, Calgary.
President-elect.—Dr. J. C. Meakins, Montreal.
Honorary Treasurer.—Dr. F. S. Patch, Montreal.
Chairman of Council.—Dr. Geo. S. Young, Toronto.
General Secretary.—Dr. T. C. Routley, Toronto.
Members-elect of the Executive Committee.—Drs. A. T. Bazin, Montreal; W. J. Knox, Kelowna; W. Harvey Smith, Winnipeg; J. E. Bloomer, Moose Jaw; J. G. FitzGerald, Toronto; C. J. Veniot, Bathurst; A. Primrose, Toronto; Léon Gérin-Lajoie, Montreal; Duncan Graham, Toronto; K. A. MacKenzie, Halifax.

The following appointments were made by the Executive Committee to the Editorial Staff:—

Editor.—Dr. A. G. Nicholls.
Assistant Editor.—Dr. H. E. MacDermot.
Managing Editor.—Dr. F. S. Patch.

CONCLUSION

Attention was given to many other details in connection with the work of the Association, which were passed on to the various committees for consideration and report.

All of which, on behalf of the Council and the Executive Committee of the Canadian Medical Association, is respectfully submitted.

T. C. ROUTLEY,
General Secretary.



The Canadian Medical Association Journal

Vol. 31

TORONTO, SEPTEMBER, 1934

No. 3

EXPERIMENTAL SILICOSIS: QUARTZ, SERICITE AND IRRITATING GASES*

By W. D. ROBSON, M.B.,

Schumacher, Ont.,

DUDLEY A. IRWIN, M.B. AND EARL J. KING, PH.D.,

*Department of Medical Research, Banting Institute, University of Toronto,
Toronto*

IN connection with his duties as medical officer of the McIntyre-Poreupine Mine, one of us (W.D.R.) was struck by the fact that the incidence of silicosis was higher in men who worked underground than in those working in the crushing-houses of the various mines, in spite of the fact that the amount of dust was much greater in the crushing-houses than underground. On investigating, he was impressed by the number of underground men who came up suffering from headaches, and found that they had been working in a "gassy" atmosphere. Ninety per cent of the time lost by illness was due to respiratory conditions, especially colds and bronchitis. These facts suggested the possibility that the underground atmosphere, due to the noxious products of combustion from blasting and the slightly lowered oxygen and increased carbon-dioxide content, had of itself an injurious effect on lung tissue which in some way might accelerate the production of silicosis. Having satisfied himself that this condition was worth investigating, the matter was taken up with the management in September, 1932, and it was decided to approach Dr. F. G. Banting, who agreed that an experimental investigation should be carried out in the Department of Medical Research. In order to test the theory, it was decided to submit rabbits to daily exposures of a dusty atmosphere containing an appropriate concentration of noxious gas.

The noxious gases in gold mines consist mostly of oxides of nitrogen formed by the explosion of the dynamite; smaller quantities of hydrogen, methane and carbon monoxide also occur. Data on the concentration of oxides of nitrogen which might be expected in mines were obtained from a paper by Perrott, Babcock, Bitting and Jones,¹ in which the concentration of the gas was shown to range from 62 to 498 parts per million (p.p.m.) in mine drift air, 10 to 20 minutes after blasting had occurred. The average of all figures was 250 p.p.m. This corresponds to 2.5 parts per 10,000 of NO₂. Sulphurous gases occur as a result of blasting in sulphide-containing rock, e.g., pyrites. Quantities of SO₂ ranging from 0.001 per cent to 0.09 per cent (0.1 to 9 parts per 10,000) were found by Gardner, Howell and Jones² in the atmosphere of mines due to the "gases from blasting in tunnels and metal-mine drifts". In Rambousek's standard work, "Industrial Poisoning", it is stated that 1 part in 10,000 of NO, NO₂ or SO₂ is definitely, although not acutely, harmful.

The presence of finely particulate quartz in the lung has long been held to be responsible for the production of the fibrous nodules of silicosis, and the experimental introduction of quartz dust into the lungs of animals has been shown by several workers (e.g., Gardner³ and Kettle and Hilton⁴) to produce fibrotic lesions comparable with those found in the clinical condition. Jones⁵ has recently cast some doubt on this

* Read before the Section of Medicine, Toronto Academy of Medicine, on March 13, 1934.

belief, however, by his finding in silicotic lungs of large amounts of sericite—a potassium aluminium silicate of the muscovite and mica family. It is Jones' contention that silicosis occurs only in mines having a high sericite content in the rock, and he believes the silicotic nodules to be due to the presence of sericite rather than of quartz particles in the lung. In view of Jones' results, it was decided to expose animals to sericite dust as well as to silica dust.

The samples of dust used in these experiments were prepared by the Department of Mining Engineering of the University of Toronto, by prolonged grinding of the quartz and the sericite-containing schist in a steel ball mill until they were reduced to a very fine powder. The sericite schist consisted of rock from the McIntyre-Porcupine Mine, hand-picked by their geologist, whose petrographic examination showed a large amount of sericite as well as quartz and some carbonates. The quartz used for dusting was obtained from the same source (hand-picked bull quartz), and assayed, chemically and petrographically, almost 100 per cent silica. Microscopic examination of these dusts showed particles ranging in size from $30\ \mu$ down to those practically ultra-microscopic. The majority of the particles were under $5\ \mu$.

The nitric oxide gas was formed by means of nitric acid and metallic copper in a Kipp generator. This reaction leads to the production of NO which in contact with air immediately unites with O to form NO_2 . The sulphur dioxide gas used was the standard commercial product compressed in a steel cylinder.

Three groups of 25 rabbits each were subjected to daily exposures of gas, gas plus silica dust, and gas plus sericite dust. A control group of animals exposed to silica dust without gas was omitted, as this work had already been done in the Department of Medical Research by Dr. G. C. Cameron⁶ without producing silicosis, even in rabbits which survived as long as two years after being exposed to dust for a six-months' period.

The rabbits were exposed to dust and known concentrations of gas in three wooden chambers (4 by 3 by $2\frac{1}{2}$ feet). Glass windows were placed in the sides of the chambers for observation of the animals. Compressed air was fed into the chambers at a measured rate, using as a gauge a water manometer which had previously been standardized against an air meter. The air was led directly into the box in the case of the rabbits receiving gas only, and in the case of the groups receiving silica and sericite through a stout-walled flask which contained a quantity of the finely powdered dust. The flask was attached to the side of the box so that its side-arm, inserted through a rubber stopper, delivered the dust-laden air into the interior of the chamber. The flask was agitated by means of an electric motor, so as to stir up the dust continuously. A concentration of dust corresponding on the average to 200 million particles per cu. ft. (8,000/c.c.) was maintained.

The noxious gases were supplied from a central apparatus arranged to deliver the NO_2 and SO_2 into the three chambers. From this apparatus the gas was delivered through a calibrated bubbling apparatus containing petroleum oil. The rate of flow of gas was so arranged that the desired concentration of gases in the chambers was obtained.

The rabbits were exposed to an atmosphere of nitric oxide 2:10,000 and sulphur dioxide 1:10,000 for 3 hours daily. This amount of gas was found to be too great to be tolerated by the rabbits, and several died after a few days' exposure. The con-

centration was accordingly lowered at the end of three weeks to one-half this amount, namely, nitric oxide 1:10,000 and sulphur dioxide 1:20,000, for 2 hours daily.

The intention was to kill the animals of each group at regular intervals, but they died of acute pneumonitis after periods varying from 2 days to 40 weeks. Fortunately, the deaths occurred at approximately the same rate in all three groups and at about the desired intervals.

PATHOLOGICAL FINDINGS

All but two of the animals ultimately died of acute pneumonitis, bronchial in type, despite the lowered concentration of gas and the shortened period of exposure. In practically all animals the pneumonic process was confined to patchy areas scattered throughout the lungs. The microscopic observations were made on the portions of lung not involved by pneumonitis.

The lungs were removed from the animals and immediately fixed by gentle distension with 10 per cent formosaline introduced through the trachea. Blocks from the upper and lower lobes of both lungs and a mediastinal lymphatic gland were sectioned in all animals. The tissues were dehydrated in alcohols of increasing concentration, cleared in xylol, embedded and cut in paraffin. The sections from the dusted animals were mounted serially in sets of three: the first was incinerated; the second was stained with hæmatoxylin and eosin; and the third was incinerated and treated with concentrated hydrochloric acid to remove the non-siliceous ash. The sections from the rabbits exposed to gas alone were stained but not incinerated. Special fibrous tissue stains were used on selected sections.

1. *Animals exposed to gas.*—The gross appearance of the lungs of the rabbits exposed to gas was not remarkable, except for a marked congestion of the blood vessels and the patchy areas of pneumonitis mentioned previously.

On microscopic examination, widespread changes of the bronchial epithelium were seen in all animals exposed for periods longer than two weeks. This was evidenced by degeneration and desquamation (Fig. 1) of the epithelial cells associated with occasional areas of hyperplasia. Cilia could not be seen on the majority of these degenerating cells. Degeneration and desquamation of the bronchiolar epithelium were only occasionally seen. These cells showed varying degrees of flattening, which at times was pavement-like and stratified, and was more marked in animals exposed to gas for long

periods. The flattened cells were not ciliated. The walls of the bronchial tree constantly showed a lymphocytic infiltration (Fig. 1) that varied in degree in different animals. The severity of this infiltration did not indicate the length of gas exposure. The only change observed in the perivascular and peribronchial lymphatic spaces and aggregations and mediastinal lymphatic glands was slight œdema.

The alveoli in some areas appeared normal—a thin wall on which were occasional endothelial cells. In other areas there was a thickening of the alveolar walls accompanied by a marked endothelial proliferation. This endothelial proliferation was evidenced in several ways: (1) by the presence of many endothelial cells in the alveolar exudate (Fig. 2); (2) by tuft-like aggregations of endothelial cells protruding into the alveolar spaces (Fig. 3); (3) by a complete lining of the alveolar spaces with a single layer of endothelial cells (Fig. 4). In such alveoli there were occasional local protrusions of the thickened wall into the alveolar spaces (Fig. 4) which almost obliterated them. A slight endothelial proliferation was seen occasionally in animals exposed to gas as early as the third day,

but was more widespread and marked in those animals gassed for longer periods.

2. *Animals exposed to gas plus sericite dust.*—The gross appearance of the lungs of these animals was much the same as in those exposed to gas alone. Small greenish areas (sericite) were seen under the pleura. The cut surface of the lung showed similar areas scattered in an irregular manner throughout the substance. The patchy collections of sericite dust were distributed uniformly throughout all lobes of the lung, were not concentrated under the pleural surface, and did not bear any constant relationship to the bronchial tree.

The microscopic picture was essentially the same as that seen in the animals exposed to gas alone, except for the presence of the sericite dust. Many areas were seen, corresponding to the greenish patches in the gross, in which large numbers of endothelial cells containing sericite dust were present in the alveolar spaces (Figs. 5 and 6). These cells varied in size (Fig. 6), but were circular in shape, regular in outline, and their nuclei stained well. An occasional degenerated dust cell was seen, but the great majority showed no evidence of degeneration.

TABLE I.

TABULATION OF THE PATHOLOGICAL FINDINGS IN RABBITS SELECTED FROM THE SILICA+GAS GROUP

Tag No.	Duration Gas+SiO ₂	Bronchial Tree			Vasc. Lym. Agg.	Alveolar			Fibrosis			Microinc. of lung Aml. Sil. Matl.
		Epith.	Wall	Lym. Agg.		Wall	Endo.	Exud.	Alveolar	Lym. Agg.	Lym. Gld.	
49	3 wks.	degen. and desquam.	mod. infil.	×	×	slight thickening	slight endo. prolif.	mod. endo.	×	×	×	×
40	9 wks.	flattening, marked degen. and desquam.	marked infil.	slight œdema	×	mod. diffuse thickening	mod. endo. prolif.	marked diffuse endo.	×	×	×	mod
34	10 wks.	marked degen. and desquam.	marked infil.	×	×	mod. diffuse thickening	areas of mod. endo. prolif.	marked diffuse endo.	occasional early nodules	×	×	mod
46	14 wks.	desquam. and flattening	marked infil.	×	×	diffuse thickening	diffuse endo. prolif.	marked endo.	early nodules	early nodules	×	mod
36	21 wks.	mod. flattening and degen.	mod. infil.	slightly enlarged	×	diffuse thickening	marked prolif.	marked endo.	occasional early nodules	occasional early nodules	early diffuse fibrosis	mod
37	40 wks.	marked flattening with degen. and desquam.	mod. infil.	increased in number and size	×	marked diffuse thickening	marked diffuse endo. hyper.	marked endo.	scattered well formed nodules	occasional SiO ₂ nodules	marked diffuse fibrosis	marked

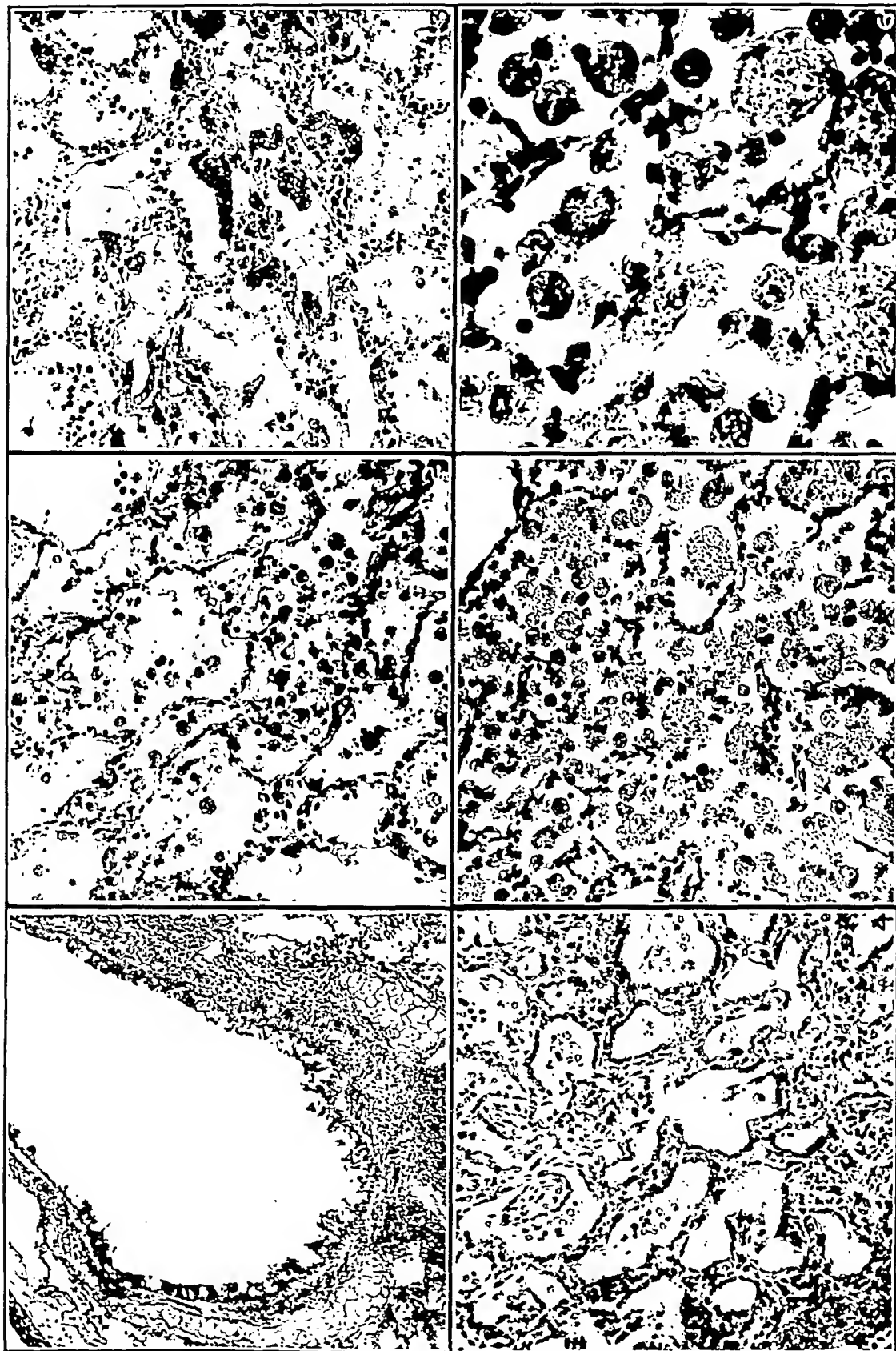


FIG. 1.—Gas rabbit. Small bronchus showing degeneration and desquamation of epithelium. L.P. FIG. 2.—Gas rabbit. Typical endothelial cell exudate in alveolar spaces. L.P. FIG. 3.—Gas. Tuft-like proliferation of alveolar endothelial cells. L.P. FIG. 4.—Gas. Marked thickening of alveolar walls and alveoli completely lined by endothelial cells. Note ingrowth of walls into alveolar spaces. L.P. FIG. 5.—Gas and sericite, 30 weeks. Showing many dust cells in the alveoli. Note lack of any fibrous reaction. L.P. FIG. 6.—High power of Fig. 5.



FIG. 7. Gas and sericite, 20 weeks. Sericite dust cells in lymphatic gland. Note absence of any fibrosis. H.P. FIG. 8.—Gas and silic. Gas and silic. Alveolar nodule showing whorl formation. H.P. FIG. 9.—Gas and silic. Invasion of wandering cells between de- Degenerated dust cells in alveolar spaces. Note thickened alveolar walls. H.P. FIG. 10.—Gas and silic. Early stage of alveolar nodule. H.P. FIG. 11. FIG. 12.—Gas and silic, 14 weeks. Group of alveolar nodules. L.P.

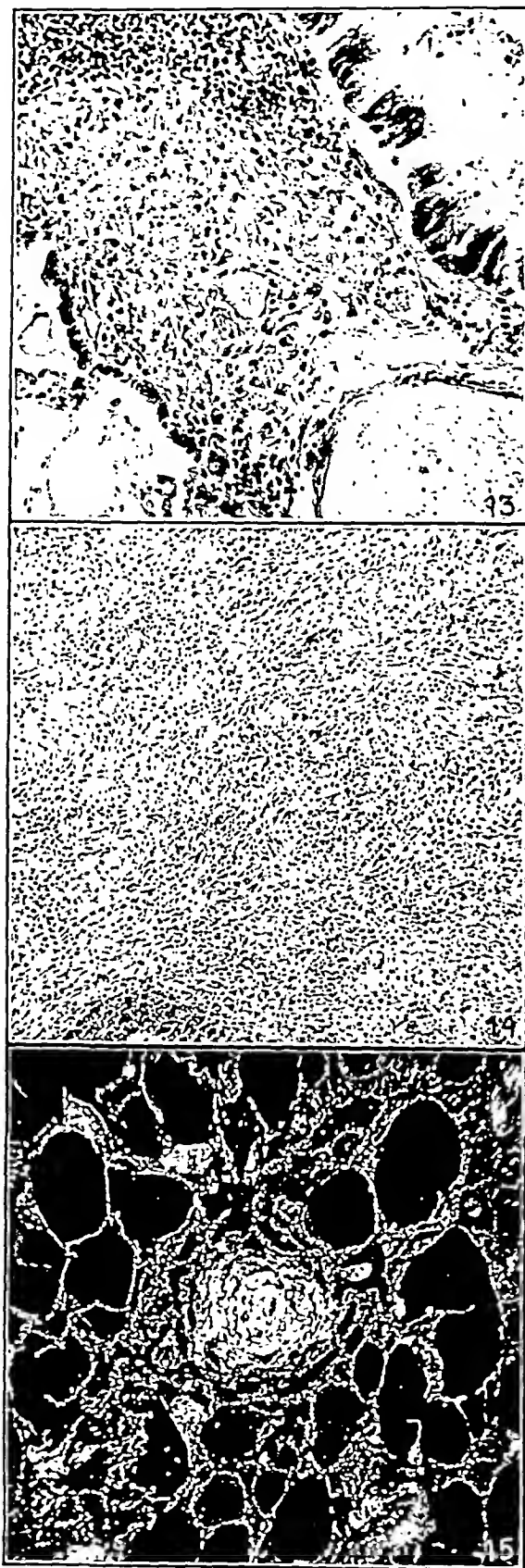


FIG. 13.—Gas and silica. Early fibrosis in peribronchial lymphatic aggregation. H.P. FIG. 14.—Gas and silica, 40 weeks. Diffuse fibrosis in lymphatic gland. L.P. FIG. 15.—Gas and silica. Incinerated section showing an alveolar nodule. The white ash in the centre of the nodule is siliceous material. H.P.

In these areas the number of cells contained within an alveolar space varied considerably. Some alveoli were packed with them, while others contained only a few. There was apparently no relationship between the presence of these cells and the thickening of the alveolar walls, as thickened areas frequently did not contain any dust cells and the walls of dust-containing alveoli were frequently not thickened. The lung tissue lying between these dust cell aggregates usually did not contain any dust cells. A few dust-containing cells similar to those seen in the alveolar spaces were usually present in the bronchial mucus. The peribronchial and perivascular lymphatic aggregations of those animals dusted for periods greater than a month usually contained a few dust-laden cells. Animals dusted for periods greater than two months usually showed similar cells in the mediastinal lymphatic glands (Fig. 7). Microincineration showed that practically all the dust in these lungs was present in phagocytic cells lying in the alveolar spaces. In all the animals of this series there was no evidence of fibrosis in the alveolar spaces, the lymphatic spaces and aggregations, or the mediastinal lymphatic glands associated with the serpentine schist dust.

3. *Animals exposed to gas plus silica.*—The gross appearance of the uncut lungs of the rabbits exposed to gas and silica was essentially the same as in those exposed to gas alone. The cut surface of the lungs of those animals exposed for periods of greater than fourteen weeks showed small firm greyish-white nodules scattered throughout the lung tissue. These nodules were scattered irregularly through all the lobes and did not appear to have any characteristic distribution. The mediastinal lymphatic glands of those animals dusted fourteen weeks or longer were enlarged to a varying degree. Some were several times the usual size. The cut surface of such glands revealed firm greyish nodules similar to those seen in the lung tissue.

Microscopically, the bronchial epithelium showed a degeneration and desquamation similar, but more marked, to that seen in the animals exposed to gas alone or to gas plus serpentine dust. The bronchiolar epithelium showed a flattening of the cells that was more extensive and marked than the corresponding flattening seen in those animals of the other groups. The walls of the bronchial tree were infiltrated with lymphocytes in a diffuse manner. The alveolar walls of most

animals of this group were thickened. This thickening was due to the lining of the alveoli by a single layer of endothelial cells, the presence of œdema and a few lymphocytes, the engorgement of the alveolar capillaries, and to some extent by an increase in the number of reticular fibres. The degree of diffuseness of the alveolar wall thickening more or less paralleled the period of exposure to gas and silica dust, and was more marked in these animals than in those exposed to gas alone or to gas and sericite dust.

There were many dust cells in the alveolar spaces. Some of these cells were regular in outline, stained well, and doubly refractive particles could be seen in their cytoplasm. Other cells seen in the alveolar spaces were obviously degenerated (Fig. 8), as they appeared swollen, their outlines were irregular, no nuclei could be seen, and they had taken on a ghost-like appearance. These cells contained little, if any, doubly refractive material, but by incineration and acid treatment of their ash they could be shown to contain large amounts of siliceous material. The number of degenerated dust cells increased numerically and relatively with increasing periods of exposure to gas and silica dust. In animals so exposed for long periods practically all the dust cells were degenerated. The greyish nodules seen in the gross corresponded microscopically to areas of alveolar tissue that had taken on a nodular formation. These nodules usually presented a small central necrotic core about which proliferating fibroblasts were arranged in a whorl-like manner (Fig. 11). Many reticular fibres were seen associated with the fibroblasts and had the same arrangement. These nodules varied in size and occurred either singly (Fig. 11) or in small groups (Fig. 12). Acid-treated incinerated sections showed these nodules to contain a relatively large amount of siliceous material (Fig. 15) concentrated towards the centre of the nodule. These nodules were seen in all animals of this group dusted for a period of 10 weeks or more, and their numbers increased with the period of exposure. The development of these alveolar siliceous nodules could be traced, commencing with the incarceration of numbers of degenerated silica-laden phagocytes in an alveolar space (Fig. 8), followed by a thickening of the surrounding alveolar wall (Fig. 9) to the extent of the complete enveloping of the group of dust

cells (Fig. 10). Active proliferation of the reticulum of the alveolar wall then took place to form the nodule. The peribronchial and perivascular lymphatic spaces did not appear to be thickened. The lymphatic aggregations showed areas of varying size (Fig. 13), composed of proliferating fibroblasts and an increased number of reticular fibres. These fibrous areas, when incinerated, were seen to contain large amounts of siliceous material. The number and size of these areas increased with the length of exposure to gas and silica dust. These lesions were seen in all animals of this group exposed for periods of 13 weeks or more.

The lymphatic glands of the mediastinum showed areas of fibrosis similar to those seen in the lymphatic aggregation. These areas varied in size from those composed of a few cells to confluent areas (Fig. 14) that occupied most of the gland. The discrete areas were spherical and had a whorled appearance. They were composed of fibroblasts and a greatly increased reticulum, though occasional lymphocytes were present. The reticulum, when stained with silver, presented for the most part a matting of fine black fibres, though in the larger fibrotic areas the fibres were coarse and stained the same as the fibres seen in the capsule of the gland. These lesions were present in practically all animals exposed to gas and silica dust for periods greater than 13 weeks. Animals similarly exposed for periods of 10 to 13 weeks showed fibrotic areas in the alveoli and lymphatic aggregations, but no fibrotic areas were seen in the lymphatic glands of these animals.

DISCUSSION

The addition of noxious gases to the atmosphere breathed by the animals used in this investigation appeared definitely to lower their resistance to pulmonary infection. Acute pneumonitis was the immediate cause of death in the seventy-five rabbits used, with the exception of two animals that were killed after an exposure of forty weeks to gas and sericite dust. This high mortality was not due to epidemic pneumonia as the animals of all groups died at varying intervals, and death from pneumonia was uncommon in the other experimental animals housed in the same animal quarters during the corresponding period. The presence of patchy areas of pneumonia in the lungs of these animals added to the difficulties of the microscopic

pathological findings. In all animals there was plenty of lung tissue not involved by pneumonitis on which observations could be made as to the lesions produced by the gas and dusts. The widespread damage to the bronchial tree and the alveoli was not confined to the areas of pneumonitis and was interpreted as being due to the effect of the gas.

In the animals exposed to gas alone, the epithelium of the bronchial tree showed diffuse changes. The epithelium of the bronchi showed much evidence of degeneration and desquamation. The shape of the ciliated epithelial cells of most bronchioles showed varying degrees of alteration, which varied from a slight flattening to marked flattening with stratification of the cells. It was difficult to interpret the amount of damage done by the gas to the cilia of the bronchial tree. The damage to the ciliary mechanism must have been extensive, however, since few cilia could be seen on the degenerated epithelial cells of the bronchi and the flattened bronchiolar epithelial cells were not ciliated. The marked proliferation of the alveolar endothelial cells and the thickening of the alveolar walls were interpreted as being due to the irritating action of the gas. It would have been interesting, if these animals had survived for longer periods, to see if the alveolar wall thickening might have progressed to obliteration of the air spaces and fibrosis in the absence of dust.

In the group of animals exposed to gas and sericite dust, the dust was present for the most part in alveolar phagocytes, but also to a slight extent in the lymphatic aggregations and mediastinal lymphatic glands. The distribution of the sericite was very patchy in all animals. This was in contrast to the diffuse distribution of the silica found in the quartz-dusted animals. The apparent "health" of the alveolar phagocytes containing large numbers of sericite dust particles and the absence of any fibrotic response to their presence, indicate a low degree of toxicity of this dust. This absence of fibrous reaction is still more remarkable in view of the fact that the ground sericite schist used for dusting contained a considerable amount of free quartz.

In the group of rabbits exposed to gas and silica dust the siliceous material was distributed diffusely throughout the lung, a high percentage being contained in alveolar phagocytes. The microscopic examination of the amount and dis-

tribution of the siliceous fibrosis was indicative of the duration of exposure to gas and silica dust. Animals exposed to gas and silica for periods of less than ten weeks did not show any areas of siliceous fibrosis, though much silica was present in the lungs. Animals exposed for 10 weeks showed alveolar fibrotic nodules only, none being observed in the lymphatic aggregates or glands. Animals similarly exposed from ten to thirteen weeks showed areas of siliceous fibrosis in the lymphatic aggregations in addition to the alveolar nodules, but no fibrosis in the mediastinal lymphatic glands. All animals exposed for periods of thirteen weeks or more showed siliceous nodules in the alveoli and lymphatic aggregations and glands, with the exception of one rabbit that did not show any lymphatic gland fibrosis. This primary alveolar fibrosis with secondary lymphatic fibrosis is the reverse of the commonly accepted order of fibrosis in chronic pulmonary silicosis. On this account, and because of the rapid rate of development, the silicosis in the experimental rabbits is considered to be acute. (Gardner,⁷ Chapman,⁸ Kessler,⁹ etc., have described "acute" silicosis in human beings).

The absence of silica-containing dust cells in the pulmonary lymphatic spaces, aggregates, and glands of these rabbits is in contrast with what obtains in sericite-dusted animals and the usual findings in human silicotic lungs. Despite the absence of such cells, many fibrotic areas containing much siliceous material were present in the lymphatic aggregates and glands. In these areas only very occasional doubly refractive particles could be seen, though in such areas large amounts of silica were present, as could be demonstrated by microincineration. Because of its invisibility in transmitted light and the lack of doubly refractive properties, this occult silica must have been present in a hydrated state. It is difficult to explain the presence of silica in these lymphatic fibrotic areas on account of the absence of dust-laden phagocytes from such areas. It is improbable that the silica was transported from the alveoli to these fibrotic areas by phagocytic cells, since no sign was seen of dust cells—intact or degenerated. It is probable that the silica which reached them consisted of very fine particles that had escaped phagocytosis in the alveoli and were carried in suspension in the lymph to the lymphatic aggregates and glands.

CONCLUSIONS

1. Exposure of rabbits to dilute irritating gases (NO_2 and SO_2) produced degenerative lesions in the lungs and predisposed to pneumonitis.

2. Exposure of rabbits to dilute irritating gases combined with sericite dust did not produce fibrotic changes in the lungs in an exposure of forty weeks.

3. Exposure of rabbits to dilute irritating gases combined with silica dust gave rise in periods of thirteen weeks or more, to an acute pulmonary silicosis, characterized by typical siliceous fibrotic nodules first in the alveoli, secondly, in the lymphatic aggregations, and, thirdly, in the lymphatic glands.

The authors wish to thank Dr. F. G. Banting for his constant interest and assistance throughout the course of this investigation.

We are also indebted to the Mine Manager, Mr. R. J. Ennis, and to the Geologist, Dr. Geo. Langford, for the interest taken and assistance given in the procuring of suitable samples of rock.

For the preparation of the samples used in this investigation we are indebted to Prof. H. E. T. Haultain, of the University of Toronto.

REFERENCES

1. PERROTT, G. ST.G., BABCOCK, L. W., BITTING, C. D. AND JONES, G. W.: Toxic gases from 60 per cent gelatin explosives, Technical Paper 482, U.S. Bureau of Mines, 1930.
2. GARDNER, E. D., HOWELL, S. P. AND JONES, G. W.: Gases from blasting in tunnels and metal mine drifts, Bulletin 287, U.S. Bureau of Mines, 1927.
3. GARDNER, L. U.: Studies on experimental pneumoconiosis, VIII, Inhalation of quartz dust, *J. Ind. Hyg.*, 1932, 14: 18.
4. KETTLE, E. H. AND HILTON, R.: Technique of experimental pneumoconiosis, *The Lancet*, 1932, 1: 1190.
5. JONES, W. R.: Silicotic lungs: minerals they contain, *J. of Hyg.*, 1933, 33: 307.
6. CAMERON, G. C. AND LANG: Immediate and ultimate effects of silica in the rabbit, *Trans. Roy. Soc. Can.*, 1933, Sect. V, p. 173.
7. GARDNER, L. U.: Pathology of so-called acute silicosis, *Am. J. Pub. Health*, 1933, 23: 1240.
8. CHAPMAN, E. N.: Acute silicosis, *J. Am. M. Ass.*, 1932, 98: 1430.
9. KESSLER, H. H.: Silicosis in the abrasive industry, *Abst. Am. J. Pub. Health*, 1931, 21: 1391.

SILICA DUST*

BY W. R. FRANKS,

Department of Medical Research, Banting Institute, University of Toronto.

Toronto

SILICOSIS is an insidious type of poisoning.

The toxic silica gains entrance to the body by being inhaled as dust particles which are deposited in the lung. Once the material has settled out on the lung surface it may either be phagocytosed *in situ* by the wandering dust cells, or it may be wafted up by the cilia of the bronchial tree and be swallowed into the gastrointestinal tract. No matter what the pathway, the net result is the accumulation of the dust-laden cells in the lung tissue. Clinical silicosis is thus primarily a pulmonary disease, and metastasis to other organs is the exception. The cause of silicosis then lies in the inhaled silica which is retained in the lung. Any factor which will modify the life-history of the siliceous atmosphere from the time of its formation to the lodging of the material in the tissues will modify the incidence of the disease. Silicosis should be preventable.

Silicon compounds may reach the lung either in a gaseous state or as dust. Gaseous silicates are known to exist, such as the silicon hydrides

and silicon tetrachloride (B.P. 57.5), but little information is available as to their possible occurrence in industrial atmospheres. The hydride is insoluble, whereas the tetrachloride rapidly breaks down in the presence of moisture into silica and hydrochloric acid. This reaction was used during the war to produce white smoke screens.

The relation of such gaseous silicates to clinical silicosis has yet to be investigated. The fact remains that experimental silicosis has been produced by the inhalation of particulate silica. In order that a silica particle may enter the lung tissue it must be of a certain size. (1) It must be small enough to persist in the atmosphere and be inhaled: particles larger than 10 microns settle rapidly. (2) It must be large enough to be precipitated in the alveoli during its sojourn there. Mavrogordato¹ places this minimal size at one-quarter of a micron in diameter. (3) It must be of a size that, once precipitated, it can be phagocytosed by the body cells.

By tissue culture we find that dust cells do not take up particles greater than 6 microns in diameter. The dangerous fraction of a silica

* Read before the Section of Medicine, Toronto Academy of Medicine, on March 13, 1934.

dust, therefore, is that composed of particles from one-quarter to 6 microns in diameter, *i.e.*, of the order of size of common bacteria.

The size of a silica particle will depend upon many factors, chief of which are the following: (1) the energy expended when the dust is formed; thus blasting dust is finer than that formed by machines; (2) the age of the dusty atmosphere or aerosol; the particles tend to aggregate with time. Whytlaw-Gray² states that "all aerosols during the first stage of their life-history contain a relatively large proportion of matter either in the molecular state or as amicroscopic particles". Within half an hour of suspension in air, however, he found this material had aggregated to form microscopically visible particles. The aggregation is more rapid, the finer the particles, and is influenced by many factors, including temperature, humidity, pressure and ionization of the gas phase. Brownian movement plays its part here, especially in particles less than one micron in size. (3) The mass of the particle may be increased by the condensation of water upon it. With neutral particles, the smaller they are, the less liable they are to take up water. If, however, the particle is electrically charged this effect will be counteracted. Water will tend to condense even on the smallest particles. The minute silica fragment in the droplet then behaves as a larger one. Density is, of course, another factor influencing the settling out of a particle. The effective specific gravity of the silica particle is not fixed. By adsorption of gases on the surface a particle may greatly reduce its effective density. Although the aggregate has an increased mass, the particle moving with its "retinue" of adsorbed gas molecules offers more resistance. Upon a similar decrease in effective density depends most of the metal recovery in this country by the flotation process.

These particles with their adsorbed films of gas may still form loose aggregates. In this connection, Köhlschütter and Tüscher³ studied the material of a silica smoke formed in an electric arc. The material possessed a low density and evidently consisted of loose aggregates. On treatment with water or dilute alkali this underwent a peptization to form a colloidal solution.

Granted that the dust persists to be inhaled, it must be deposited in the lung to be dangerous. Drinker and his associates⁴ found a retention

on inhalation of 55 per cent of marble dust varying in size from 0.3 to 6 microns in diameter. Brown,⁵ in a later study, found this retention increased as the dust became more dilute.

Some of the factors concerned in the deposition of the silica are as follows. (1) The settling effect due to gravity or mass attraction. This is probably considerable, since the distance to settle in the alveoli of the lung is small. The average time allowed for settling is roughly equal to

$$\frac{\text{Supplemental} + \text{Residual Air}}{(\text{Tidal} - \text{Dead Air}) \times \text{Respiration Rate per Minute}}$$

which is of the order of one-half minute. The settling effect is probably increased by the cooler dust particle taking up water in the lung. (2) The impinging action of the dust as it passes down the irregularities of the air ducts. In both this and the foregoing the larger particles are most concerned, but the centrifugal action of the air-flow down the passages probably deposits most of the large material on the ciliated epithelium before it reaches the alveoli. (3) Electrical attraction between the dust particles and the alveolar wall also plays its part. The charge on the lung wall probably changes sign with the cardiac and respiratory cycle, so that at one phase in the cycle the charged particle is bound to be attracted. Thus Yaglow, Benjamin and Brandt⁶ found that expired air was devoid of small ions.

Opposing the deposition of the particle is the heat radiation from the lung wall. Radiant energy will cause a particle to move away from the region of greater radiation toward the less. Thus dust particles tend to settle on cold bodies. An attempt to use this principle for dust abatement has been made in South Africa. An example of it is seen in the deposit of dust on the ceiling of rooms. The dust accumulates on the colder areas of less radiation between the laths. Such a radiation gradient exists at the warm lung surface. The diffusion of water vapour from the alveolar wall aids this effect. Gibbs suggests that this is the determining factor in the non-deposition of material under one-quarter of a micron in diameter.

Once the silica is taken into the body cells it begins to exert its toxic action. In view of its slight solubility the determining factor in the reaction must be one of surface rather than of mass. Thus the course of uncomplicated

silicosis, once it is established, is not greatly affected by removing the man from the dusty air. At present the non-complicated silicotic is not removed from his occupation. The dangerousness of a silica dust is, therefore, proportional to the total surface of the particles of a size which may be deposited in the lung.

The methods used in the past for measuring the dustiness of the air have been either gravimetric or chemical, both of which depend upon the mass of the offending dust. Dust is also measured by counting the number of particles in a unit volume. The method most widely used in the mining industry, both here and in South Africa, is the konimeter count. The konimeter samples probably recover by impingement as great a proportion of the material as the lung retains. It is also very convenient to use. The slides may be treated by the South African method of hydrochloric acid and heat to remove all but the siliceous material. Neither the count nor the gravimetric method estimate the real dangerousness of the dust, which can only be done by estimating the surface. The dust spots from the impinged volume of air are estimated under the dark field microscope by counting the number of particles in two sectors at right angles to each other across the field. The results are expressed as particles per c.c. The repeated counting of such fine particles is very arduous and fatiguing; only about a dozen estimations can conveniently be completed in a day.

TABLE
CORRELATION BETWEEN COUNT AND PHOTOMETRIC VALUE
OF DUST FROM MINE DRIFT AFTER BLAST

Photometric Light Value	Dust Count	Ratio Light Value/Count
1500	1536	0.98
830	877	0.96
840	844	1.00
730	788	0.94
450	499	0.90
450	492	0.91
420	448	0.94
390	421	0.93
390	415	0.94
340	394	0.86
330	380	0.87
300	334	0.90
300	329	0.91
250	248	1.00
140	100	1.40
120	88	1.35
80	82	0.98
100	82	1.22
80	75	1.06
Average = 0.99		

We have recently developed a method which obviates this difficulty. Instead of counting the particles, the amount of light reflected by the dust spot under the dark field is measured photometrically. Under standard conditions this is proportional to the surface of the dust recovered. The light may be measured either by a comparative photometer or a photo-electric cell. The foregoing Table shows some of the results obtained by this method.

The samples were taken in a drift following blasting while the dust was being removed by a method to be described later. The size of the particle was about the same throughout, and the constancy of the light value to count ratio is noteworthy. This photometric method is also much more rapid and simpler to do; as many as one hundred samples or more may be estimated in a day. It should greatly facilitate a closer check on the actual dust exposure of the

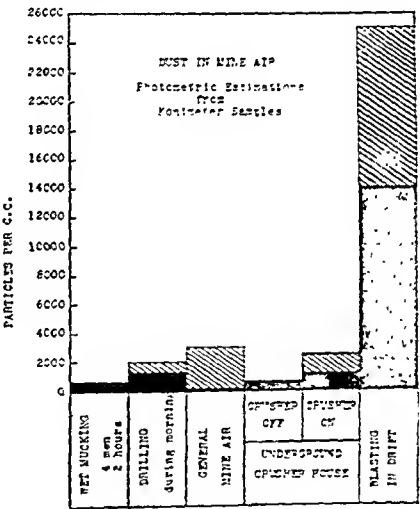


FIG. 1

men in industry. Only by the correlation of such information with clinical findings can the true dangerousness of the dust hazard be estimated. In Fig. 1 are illustrated some representative dust concentrations encountered in mining operations, as measured by this method.

It will be noted that the highest dust concentrations in which the men work are encountered in drilling and blasting operations. Blasting, however, raises much the most dust. Most of the blasting underground is done in either stoping or drifting operations. In stoping blasting the men do not go back into the drift until the next shift, but in drifting they must return to the face after a blast is set off.

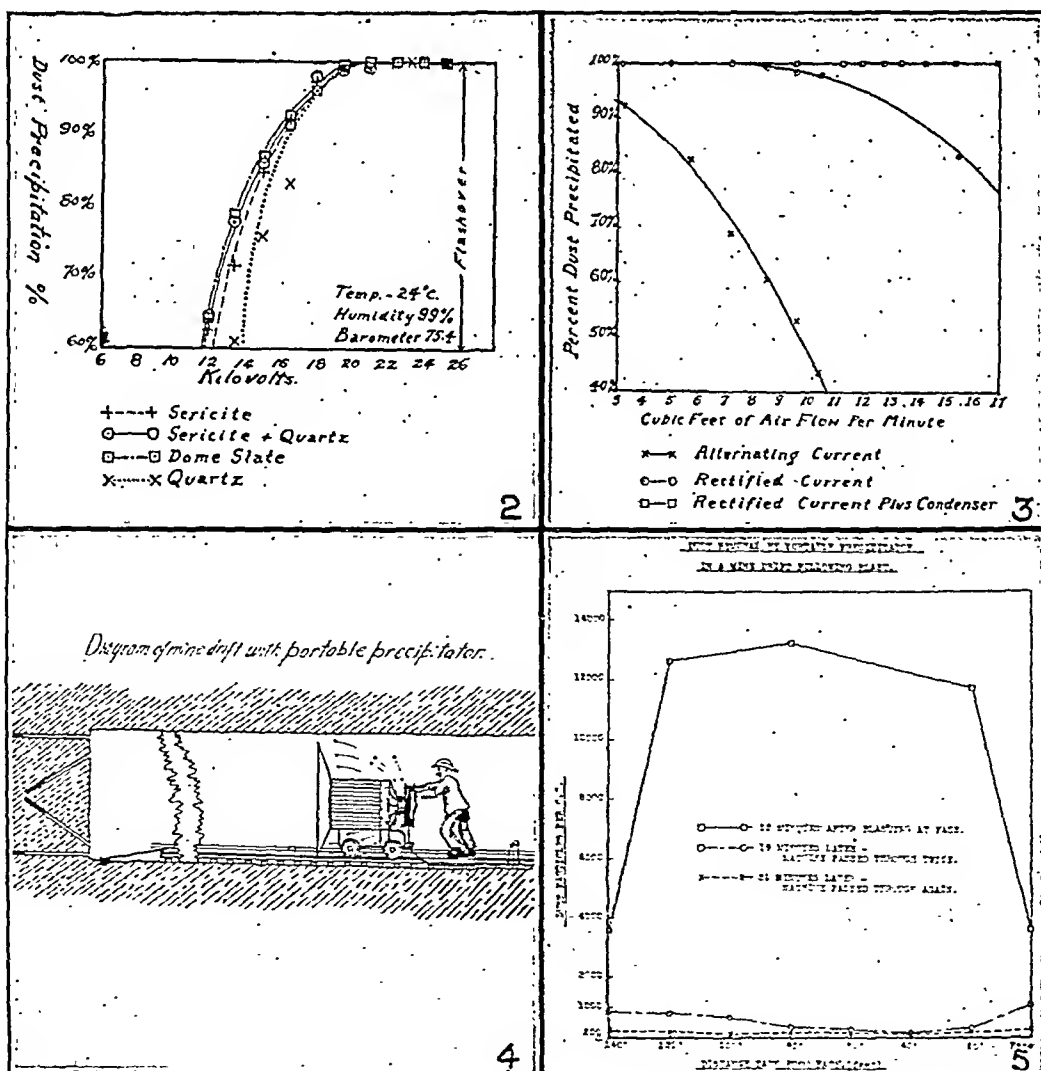
the heavy dust cloud. This dust not only is of the highest concentration but is of the smallest size, and is consequently the most dangerous.

Experiments looking to remove this hazard have been in progress for some time. Any method of successfully removing this dust must fulfil the following requirements. (1) It must remove the fine dust. (2) It must do this rapidly. (3) It must be of such a kind that it can be used where blasting is in progress.

A survey of the methods hitherto used for dust removal showed that electrical precipitation, as originally applied by Lodge, and later developed by Cottrell, would probably fulfil the first two requirements. In this the dust-laden air is drawn through a metal pipe, down the centre of which is suspended a wire on which is placed a high electric charge (to give a corona effect). A stream of electrons thus passes from the wire to the metal pipe which is grounded. As the dust particles are drawn through they pick up a charge and are swept by the electric bombard-

ment to the grounded pipe wall. The effect of such a device on silica dust was consequently studied. Fig. 2 shows that silica dust can be completely precipitated by this method, thus fulfilling the first requirement. The second requirement—rapid precipitation—is seen to be accomplished in Fig. 3. Thus a tube 2 inches in diameter and 15 inches long was found to reduce to safe levels about 8 cu. ft. of air per minute.

A method of meeting the third requirement—ability to be used where blasting operations are in progress—is illustrated diagrammatically in Fig. 4. This was done by mounting a precipitator unit designed to treat 3,000 cu. ft. of air per minute on a mine truck, the whole machine to be pushed ahead of the men as they returned through the dust cloud cleaning up the dust in front of them. The dust-laden air of the drift is brought into the machine by means of a hood. An efficient clean-up is obtained by deflecting the clean exhaust air from the machine into the



irregularities of the drift as it passes along and the dust therein is blown forward and drawn into the machine. The machine is likewise retired with the men during the next blast.

Such a machine has been constructed under the auspices of the Ontario Mining Association. The precipitator unit consists of 200 two inch tubes mounted on mine truck wheels. This is fitted with a suction fan, the power being supplied by a trailing cable. In Fig. 5 is shown the performance of the experimental unit on passing through the dust cloud formed by an explosion in a mine drift. The abscissæ are given as distance in feet back from the face where the explosion occurred. It will be seen that the first requirement is successfully met, in that the dust is reduced to safe levels. Furthermore, the dust from this blast, being removed at its source, is prevented from contaminating the general mine air. The time required (30 minutes) is, however, rather long. Most of this is due to the difficulty of getting all the dust from the irregularities of the drift into the machine. The third requirement—use under blasting conditions—is met, except that on some occasions the rock thrown out on the track makes it difficult to advance the machine near to the face. A further problem was found in the nitric oxides and ozone formed by the corona in the machine. Experiments on animals exposed to the exhaust of such a corona showed no toxicity after 6 months' daily exposure for

two hours. But due to the necessity of a well-marked cyclonic action to reach all the dust considerable recirculation takes place, with resultant accumulation of gas. However, war experience has shown that gas removal offers no insurmountable problem and is simple as compared with the removal of particulate matter. It is thought that with the cooperation of the mine operators, development along these lines should make much of silicosis preventable by removing the inhaled cause.

In the building of the dust precipitator, we have to acknowledge the technical assistance of Mr. F. L. Harrison and others of the staff of the Ontario Hydro-Electric Power Commission Laboratories. The work in the field has been done with the cooperation of Mr. R. J. Ennis and Mr. A. D. Campbell, of the McIntyre Porcupine Mines. The dust estimations have been carried out with the assistance of Miss L. Tresidder, and the tissue culture work with that of Miss A. J. Watt.

REFERENCES

1. MAVROGORDATO, A.: Value of the Konimeter, Publications of South African Institute for Medical Research, 1923, no. 17, p. 14.
2. WHITLAW-GRAY, R. AND SPIERMAN, J. B.: Method of determining the size of particles in smokes, *Proc. Roy. Soc., Series A*, 1922-23, 102: 627.
3. KÖHLSCHÜTTER, V. AND TUSCHER, J. L.: Über Darstellung disperser Substanzen in gasförmigen Medien *Zeitschr. f. Elektrochem.*, 1921, 27: 225.
4. DRINKER, P., THOMSON, R. M. AND FINN, J. L.: Quantitative measurements of inhalation, retention and exhalation of dusts and fumes by man: concentrations of 50 to 450 mg. per cubic metre, *J. Indust. Hyg.*, 1928, 10: 13.
5. BROWN, C. E.: Quantitative measurements of inhalation, retention and exhalation of dusts and fumes by man: concentrations below 50 mg. per cubic metre, *J. Indust. Hyg.*, 1931, 13: 285; Studies in dust retention *ibid.* p. 293.
6. YAGLOW, C. P., BENJAMIN, L. C. AND BRANDT, A.: The influence of respiration and transpiration on ionic content of air of occupied rooms, *J. Indust. Hyg.*, 1933, 15: 8.

TUBERCLE BACILLI IN THE CIRCULATING BLOOD.—W. Kolle and E. Küster report investigations which altogether fail to confirm the claims made by E. Loewenstein, who has found tubercle bacilli circulating in the blood of some 50 per cent of the subjects of tuberculosis, and in considerable proportion of cases of rheumatic polyarthritis, schizophrenia, and multiple sclerosis. Following Loewenstein's technique, the authors have made 1,033 examinations of 953 patients suffering from tuberculosis or from one of the other diseases already referred to. Positive results were obtained in only 7 cases. In one of these 7 cases the bacilli were found by animal experiments to be virulent. In 5 of the 7 positive cases the disease from which the patients were suffering was tuberculosis, definite or suspect. Among the 111 rheumatic cases, which included some of erythema nodosum, there was only one positive blood finding. The remaining positive finding belonged to the group of 128 cases of schizophrenia and allied conditions. All the 15 cases of multiple sclerosis and all the 68 cases of various other diseases yielded blood in which no tubercle bacilli could be found.—*Deut. med. Wchnschr.*, 1934, p. 309.

According to Flinn and Inouye, only a small fraction of ingested copper is eliminated promptly in the urine. Therefore the study of the latter excretion in man is not without interest at this time. At the Montreal General Hospital, Rabinowitch has carefully examined the urine of fifty persons selected at random except that histories were carefully taken in order to exclude cases in which there was any suggestion of undue exposure to copper through treatment or occupation. From the analytic results, copper appeared to be a constant constituent of urine of normal persons. The amounts found ranged between minute traces and 0.4 mg. per litre and between traces and 0.7 µg. for twenty-four hours. In two copper "balance" experiments in which the subjects were fed copper, the amounts were appreciably larger. On these occasions they consume quite unwittingly, day by day, the enormous quantities of copper that the data permit of. Probably there is more normal tolerance of excessive intake than of deficiency of copper in the dietary. At any rate the latter is a consideration in present-day therapeutic practice and should be advised. Intensive study of the problem is imperative.—*J. Am. Med. Ass.*, 1934, 101: 212.

CYSTINURIA AND CYSTINE LITHIASIS*

By FRANK S. PATCH, B.A., M.D., F.R.C.S.(C.),

Montreal

CYSTINURIA and cystine lithiasis are generally regarded as comparative rarities. And yet cystinuria is the most common of all the so-called "inborn errors of metabolism", and in all probability would be more frequently recognized were those doing routine urinalyses more familiar with the characteristic crystals of cystine, and constantly on the watch for them in urinary sediments. Similarly, cystine calculi would be diagnosed more frequently were all calculi subjected to chemical analysis.

The occurrence recently of a case showing this condition, and its tardy recognition in a brother of the patient who had been operated upon for calculous pyonephrosis ten years previously, together with the many interesting problems connected with the subject, seem to warrant a report of the two cases and a brief discussion of the subject.

CASE 1

William C., aged four, was admitted to the surgical service of the Montreal General Hospital, September 8, 1921, for rectal prolapse. The parents had noticed a protrusion of bowel at stool two months previously. This had recurred frequently. The boy was also reported to have had difficulty in urinating. He was brought to the Outdoor Department on August 24, 1921. A note was then made of urinary frequency; "the child pulls at the penis"; "urination is painful". On August 31st, he was catheterized for urinary retention, and, again, on September 1st. On September 2nd, the catheter was blocked in the membranous urethra, but it passed the obstruction and the urine was removed. An x-ray, September 3rd, showed a shadow, "fairly large, dense and circular, in the midline below the pubic arch". This was regarded as a urethral calculus. A large group of shadows was noted in the left kidney region. That same evening retention recurred. The catheter was blocked, and at the point of block a grating was felt. Under an anæsthetic a stone was palpated about the penoscrotal junction. After attempts to remove it by forceps failed it was removed by external urethrotomy. No note was made of the character or composition of the stone. The wound healed well, but fever developed and pyuria was noted. Cystoscopy was performed on September 27, 1921, with a 18 French cystoscope under ether anæsthesia. The bladder was normal. The common specimen contained much pus, as did the left ureteral specimen. The right ureteral specimen was normal. Urea: right, 0.9 per cent; left, 0.4 per cent. The left kidney was removed, September

20, 1921. The kidney was large. The stone was firmly wedged in the pelvis. Pyelo-lithotomy was discussed, but on account of the infected condition of the kidney a nephrectomy was done. Recovery was uneventful.

Pathologist's report.—(S. 21. 812. Dr. L. J. Rhea). "Kidney weighs 75 gm. and measures 8 by 6 by 3.5 cm. There is a small amount of perinephritic tissue attached. Capsule is smooth and glistening. On palpation several hard, somewhat movable masses are felt. The pelvis incised contains 4 calculi, yellowish green, of irregular shape with faceted surfaces. The cortex measures 6 mm.; its markings are distinct. The surface is greyish-pink in colour. The calyces are uniformly moderately dilated. The pelvis is smooth and glistening. No pus apparent. No tuberculosis. Capsule strips easily, exposing a smooth surface studded with petechial hæmorrhages. It is pinkish-grey for the greater part, the remainder being irregular areas of greyish-white covering about one-half of total surface. On section there are similar areas of greyish-white extending to the pelvis.

"Diagnosis.—Nephrolithiasis with diffuse chronic inflammation of kidney. Calculi are composed of uric acid."

This statement as to the composition of the calculi has given rise to considerable conjecture, when, as will later be shown, the boy was found to be a cystinuric. Neither the kidney nor the calculi in it have been preserved. In all probability the diagnosis was made by observation only, for it was not until several years afterwards that facilities were available for routine chemical analysis of calculi. It is well known also that uric acid and other calculi very closely resemble those composed of cystine. Moreover, cystine calculi are frequently found mixed with other urinary constituents. In view of the subsequent developments, it is quite possible, indeed very probable, that the calculi were composed of cystine. This lad, who is now 17, has been apparently quite well since the operation 13 years ago. Since his cystinuria was discovered in 1932, his urine has been repeatedly found to contain cystine crystals, the last examination being made on May 29, 1932.

CASE 2

John C., aged 17, brother of the preceding was admitted to the surgical service of the Montreal General Hospital, on October 24, 1931, suffering with right-sided abdominal pain and vomiting. A diagnosis of acute appendicitis was made, but a normal appendix was removed. There had been no complaints associated with the urinary tract, though the pain was reported as being colicky. After the operation, an x-ray was taken, which showed a large shadow

* From the Departments of Urology and Metabolism, the Montreal General Hospital, Montreal.

Read at the Sixty-fifth Annual Meeting, Canadian Medical Association, Calgary, Alta., June 22, 1934.

in the left renal area. He was, thereupon, transferred to the urological service. A cystoscopy was done on October 31, 1931. This confirmed the presence of a stone in the left kidney. There were evidences of trauma about the right ureteral orifice, suggesting the passage of a calculus. A left nephrolithotomy was performed on November 13th and two large stones were removed. Recovery was uneventful. Metabolic studies showed a reduction of renal function. Blood urea nitrogen, 24 mgm. per 100 c.c. Urea concentration factor, 24. He was discharged from the hospital on December 4, 1931.

He was readmitted on May 3, 1932, with a left renal colic of a few hours' duration. The urine contained red blood cells. There was a frequent desire to void. The patient was chilly and had vomited. X-ray showed a number of small shadows in the left kidney. Cystoscopy and pyelography demonstrated that they were renal calculi. No action was taken at this time, and he was discharged from hospital. He was readmitted on October 6, 1932. In the interval he had been free from symptoms until the day previous, when he was seized with a severe colicky pain in the left loin, radiating to the groin. X-ray examination was as on previous admission, except that a small shadow was noted in the upper pole of the right kidney. Urinalysis showed a trace of albumin, and urates. Cystoscopic examination was negative. Pyelography showed the kidneys to be normal, except for slight blunting of the calyces of the left kidney. The shadows were intra-renal. The urines from both ureters contained a few pus cells, but no bacterial growth was found on culture. October 12th, the stones, seven in number, were removed from the left kidney by nephrolithotomy. The pelvis was intra-renal and the kidney very adherent to the surrounding fatty capsule, making operation rather difficult. The day following operation characteristic cystine crystals were noted in the urine by an observant intern. This revelation prompted an immediate chemical examination of the stones. They were found to be composed of 90 per cent pure cystine. One of the laboratory technicians pointed out that there was a similar stone in a bottle, in which it had been for a year or so. This was examined and found to be pure cystine. It was discovered that this was the calculus removed from the same patient one year previously. Its unusual character had evidently aroused curiosity, and it had been sent to the laboratory for chemical examination. The fact that it was not reported upon had been overlooked and the incident forgotten.

The boy's wound healed normally. His urine was found on repeated occasions to contain cystine crystals. He was retained in hospital until December 10, 1932, mainly for the purpose of making complete metabolic studies, details of which will be given later. The members of the boy's immediate family were examined for the presence of cystinuria. The father, mother, one brother and two sisters were negative, but one brother (Wm.C., Case 1) was positive; cystine crystals were isolated in pure form, and chemical identification made. This was the lad whose left kidney had been removed in 1921 for calculous pyonephrosis.

In spite of the treatment instituted there has been a recurrence of calculus in the left kidney, with progressive increase in the size and number of the calculi. That in the right kidney has also continued to increase in size. The last x-ray taken, May 25, 1934, is shown in Fig. 5. Cystine crystals were noted continuously, the last examination being made on May 29, 1934.

Historical.—Cystine was first discovered by Wollaston in 1810, in two specimens of bladder calculus. It was styled by him "cystine oxide". Later, at the suggestion of Berzelius (1833) the

name was changed to "cystine". Since this time, an increasing amount of literature, clinical, and, more recently, on the biochemical aspect of this problem, has appeared. In 1916, Kretschmer collected 107 cases of cystine lithiasis. It is very probable that the actual number of cases observed is much larger, owing to the failure of individuals to report their observations.

Chemistry.—Cystine is a normal constituent of protein and is obtained in greatest amounts from keratin-containing tissues (horn, hoof, feathers, hair, etc.). It is an amino-acid and is the principal, if not the only, sulphur-containing body which results from the hydrolysis of simple protein. Nutritional experiments have clearly shown that cystine is a necessary component of the diet, in order to maintain health and growth. During its destruction by the body the nitrogenous part is largely converted into urea, and the sulphur portion is largely oxidized and excreted in the urine as inorganic sulphate. Another pathway is through taurine, a normal constituent of bile. Cystine is almost insoluble in water, alcohol, and ether, but it dissolves readily in dilute mineral acid, ammonia and solutions of caustic alkalis, and the alkaline carbonates. It is insoluble in acetic acid. It crystallizes from its solution in ammonia in typical hexagonal, colourless, highly refractile plates or prisms when the solution is allowed to evaporate (see Figs. 1 and 2). Crystals for microscopic examination are conveniently obtained in this manner on a microscope slide. The sulphur in cystine is held in loose combination and is partially evolved as hydrogen sulphide on boiling with alkali. This helps to distinguish it from other amino-acids, and also explains the odour of hydrogen sulphide which results when urine containing cystine is allowed to decompose. If cystine is heated on a platinum foil it burns with a bluish-green flame without melting. The amounts found in urine are never very great. Even in cystinurias, the amounts are small, but cases have been reported with excretions of one-half to one gram per diem. There are a number of methods of identifying cystinuria, but the isolation of the cystine crystals in pure form is the most reliable. The relative merits of the more common reactions used clinically will be dealt with elsewhere.

Metabolism.—In cystinuria, due to what Garrod calls "an inborn error of metabolism", the liver allows an excess quantity of cystine to escape conversion into urea. It has been sug-

gested that cystinuria is due to incomplete oxidation of the cystine unit with protein. This is based upon the finding at times of putrescine and cadaverine and, more rarely, leucine and tyrosine. It is doubtful, however, whether the presence of cystinuria is due to inability of the body to metabolize cystine, since cystinurics are able to metabolize large quantities of ingested cystine. Dr. Rabinowitch is of the opinion that we are dealing with a condition analogous to the glycosuria in renal glycosuria. In this condition glucose appears in the urine as a result of an undue permeability of the kidneys to sugar, and not from any failure of the patient to oxidize glucose; the blood sugar is normal in this condition. In cystinuria, there is probably a lowered liver threshold for cystine in the blood. There thus appears to be no relationship between blood concentration and urinary excretion.

Cystinuria is a comparatively rare condition. According to various authors, it is found in from 1 in 15,000 to 1 in 35,000 persons. This is based on the findings of the crystals in the urine. Newer laboratory methods suggested by Brand and Sullivan have shown the presence of cystinuria where the crystals have not been found. Using the Brand and Sullivan tests, Lewis has demonstrated 29 positive cases in 11,000 healthy young individuals (1 in 320), a much higher percentage than was previously thought the case. It must be borne in mind, however, in the interpretation of the Brand and Sullivan tests that the colour reaction is not specific for cystine. It is given by any compounds which contain the free S-H group. It is doubtful, however, whether, apart from ergothionine and glutathione, there are other compounds in appreciable quantities in the human body which contain the S-H group. The reaction of Brand and Sullivan, though not specific for cystine, is much simpler and probably more sensitive than the chemical isolation of cystine crystals. The relative sensitivity might, therefore, explain the high incidence of cystinuria noted with this reaction.

As cystinuria is symptomless it is often overlooked, and even where cystine calculi are present their true nature is not suspected, as in our first case. When it does appear, it does so in early life, rarely after 50. The hereditary tendency and the strong familial character are very marked. In our series it occurred in two

brothers. Kretschmer reported cystinuria and cystine lithiasis in twin brothers. Robson observed 12 cases in three generations, in whom several deaths apparently directly or indirectly attributable to the derangement had occurred. Graves found 8 cystinuric members in two generations in the family of the patient whom he treated for cystine stone. The most remark-

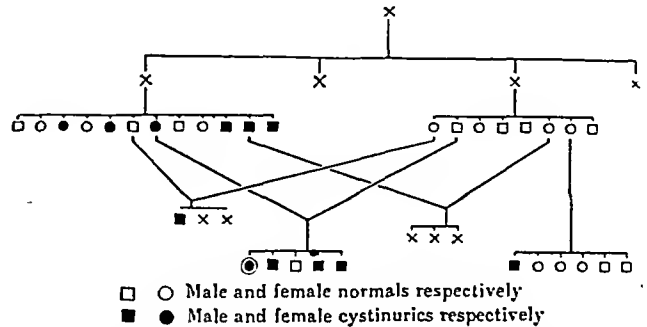


CHART 1.—Showing familial character (Robson).

able occurrence in this respect concerns the progeny of two half-brothers, reported by Thin. The older had 12 children; 5 of these had cystine lithiasis; 2 were cystinurics. Of his grandchildren, 2 had lithiasis, 4 had cystinuria. The younger half-brother had 10 children, none of whom had cystinuria. Three of his children married their cousins, children of his older half-brother. Their children in 2 cases were afflicted with cystinuria. One of his daughters married a distant relative and had one son who had to have an impacted calculus removed from a ureter.

Lithiasis.—The percentage relation of cystine calculi to all other calculi varies largely, according to different authors. Pousson and Carles state that they occur in a percentage of 0.26. Lamy gives a percentage of 0.57, while Nakano gives as high a percentage as 1.16 and Kuster 2.5. According to Gottstein, it is generally thought that 2.5 per cent of cystinurics develop cystine lithiasis.

A cystinuric afflicted with lithiasis does not necessarily form cystine calculus, and, at times, the cystine is found mixed with other salts. It is a mistake to think that cystine calculi are always unilateral; they are frequently bilateral. Most authors admit a strong tendency to recurrence. Garrod suggests that infection of the urinary tract may play an important part in the formation of this type of calculus, as of those of other materials. He points out that a cystinuric with sterile urine may live for many years without forming calculi, and

suggests the use of measures directed against urinary infection in such cases. And yet there are cases reported of cystinurics with sterile urines, who formed stones persistently, and others with markedly infected urines who did not form calculi.

Cystine calculi are of a light amber or fawn colour, and are somewhat waxy in appearance.

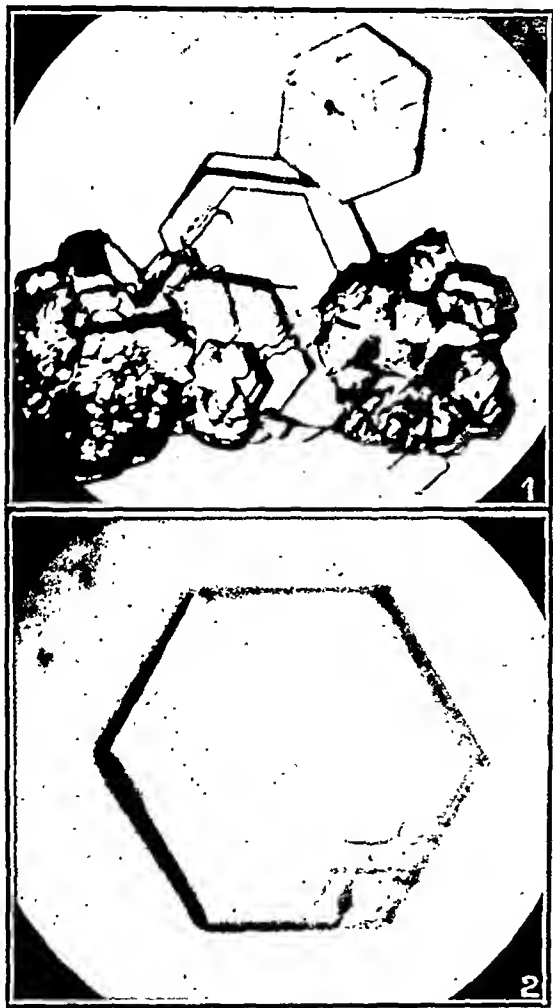


FIG. 1.—Cystine crystals isolated from the calculus in Case 2, with clear demonstration of a single crystal.

FIG. 2.—Enlargement of a single crystal.

They are granular and glistening. According to some they are rather soft and friable. On section they show a pale green and waxy appearance. It is stated that after exposure to light, the green coloration is accentuated. They may be readily confused with uric acid calculi, unless a careful chemical examination is made. Braasch points out that, as cystine calculi are frequently unilateral, there may be an anatomical factor in the kidney itself to account for

the formation of calculi. In neither of our cases was any factor found, other than that resulting from the presence of the calculi, in producing dilatation and infection of the kidney.

In our opinion, there is no essential difference between the lithiasis produced from cystine and that of other materials, with the one exception that in cystine lithiasis a definite disorder of metabolism is associated. It may be remarked that in calculus formation generally an error of metabolism may equally well be present. Recent experiments with diets deficient in certain vitamins strongly favour this assumption. Certainly, the factors which favour the formation of urinary calculus in general will favour the production of cystine calculus. The same effects of obstruction, dilatation and infection, may follow. From the point of view of symptomatology, diagnosis, and treatment, there is but little difference, and these matters, with a few undermentioned exceptions, call for no special consideration in this paper.

With regard to the visibility of cystine calculi, there seems to be a general impression that cystine calculi cast a faint shadow in an x-ray picture. According to some, xanthin and cystine give the faintest shadows of all calculi. This is said to be the case particularly with pure cystine calculi. In Graves' case there was no demonstration of the calculus in repeated x-ray pictures. On the other hand, Holmes and Ruggles state that phosphates and cystine are the densest of all calculi. Other authors agree with the view that cystine calculi are quite opaque. Our own experience in the two cases conforms to this opinion, and in our second case the calculi were almost pure cystine. It may be that the small stones are not readily seen, as some infer. In any event, in view of the contrary findings, as in Graves' case, one should take special precautions in patients who give a negative x-ray and have cystinuria or a positive result to the tests of Brand and Sullivan. In such cases, further methods of investigation should be used, including that of the wax-tipped catheter.

With regard to medical treatment, many efforts have been made by dietary control and alteration of the reaction of the urine to prevent calculus formation, or, once resulting, to bring about its dissolution. Most authors stress the importance of a low protein diet. It may be pointed out, however, that a cystinuric is able

to metabolize cystine readily, even when it is given in large quantities. Largely because of the ready solubility of cystine in a dilute alkali, efforts have been made to bring about a dissolution of the offending calculus by the internal administration of alkalis. Kretschmer states that Cantani and Klemperer and Jacoby recorded "remarkable results" with this method. Beale claims successful results in a patient he had observed during a period of fifteen years. The patient, a cystinuric, had passed "hundreds of small calculi" and had had a bladder stone crushed by lithotripsy. Following the administration of ammonium carbonate, 50 grains per diem, over a period of a year, the calculi decreased in number, and in the last three or four years none had been passed; the cystine crystals were still noted in the urine but in smaller amount. Crowell and Reaves claim to have produced dissolution of large calculi in the kidney pelvis by the use of sodium bicarbonate, and pelvic lavage with an "alkaline antiseptic solution". Reaves' case had an associated *B. coli* infection. The subsidence of infection and complete disappearance of the calculus in the kidney occurred in a period of three weeks. The patient had taken 60 grains of the sodium bicarbonate daily during this period. In both of these cases, the cystine crystals disappeared from the urine. It is not surprising that some authors even question the wisdom of surgical interference, in view of the extreme tendency to recurrence after the operation.

The unsuccessful result of surgery in our

second case, prompted us to make similar therapeutic experiments. With the active cooperation of Dr. I. M. Rabinowitch, Director of the Department of Metabolism, the patient was subjected to a course of treatment under careful observation.

First of all, cystine obtained in pure form from the patient's calculi was exposed to solutions of pH ranging between 5.8 to 8.2. These were kept in an incubator at 40° C. from November 18, 1932, to March 11, 1933, that is, for a period of 113 days. No solution of the cystine was observed, in spite of a pH as high as 8.2, a degree which is incompatible with life and which cannot possibly be produced in the body by the administration of alkali. The patient himself was maintained from November 3 to 9, 1932, on a weighed diet. During this time the CO₂ combining power of the plasma and the pH of the urine were determined periodically. The patient was then given an "alkaline ash" diet. There followed no alteration in the CO₂ combining power of the plasma, nor in the pH of the urine.

Following his discharge from the hospital, December 10, 1932, he was asked to follow an alkaline-ash-low protein diet, consisting of approximately 352 gm. of carbohydrate, 70 gm. of fat, and 50 gm. of protein daily. He was instructed to take 160 grains of sodium bicarbonate daily. This was done until January 5, 1933, according to the patient, faithfully. The patient was instructed how to test the reaction of the fasting urine with litmus. The urine was



FIG. 3. Case 2.—X-ray; first recurrence of calculus, October 7, 1932.

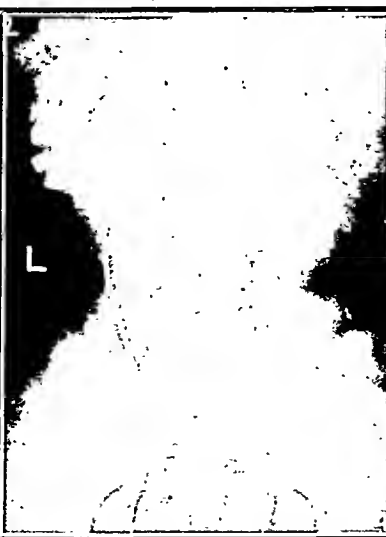


FIG. 4. Case 2.—Pyelogram, October 7, 1932.



FIG. 5. Case 2.—X-ray; second recurrence of calculus, May 25, 1934.

continuously alkaline and was tested daily. On January 5th, the dose of sodium bicarbonate was increased to 200 grains per dram. On June 2, 1933, the urine was alkaline, with a pH of 7.7.

X-ray examinations have been made from time to time. There has not been the slightest improvement. On the other hand, there has been, in both kidneys, particularly in the left, a progressive increase in the size and number of the calculi. Infection has, fortunately, been absent, or, at the most, minimal. His urine on May 29, 1934, showed no pus, the only abnormal constituents being cystine crystals and an occasional red blood cell. He has been free from painful symptoms, and his general health has been excellent. In spite of the successful results obtained by some authors with alkalinization of the urine, we have to admit a complete failure in our efforts not only to prevent recurrence of the calculous lithiasis but, also, extension of their growth. This is in accord with the experience of many others.

It should be pointed out that, in many instances, surgical intervention has been followed by perfectly satisfactory results, without recurrence, even where no dietary control has been maintained and no efforts have been used to alter the reaction of the urine. Surgery was successful in our first case, in which a nephrectomy was performed. In spite of a cystinuria, presumably persistent, there has been no recurrence of the calculus in the other kidney. Surgical intervention is still possible and is being considered in the second patient who still suffers from bilateral lithiasis.

CONCLUSIONS

1. The subject of cystinuria is still veiled in obscurity and no entirely satisfactory explanation has yet been given for its occurrence.

2. In cases of cystinuria most authorities advocate that the patient be placed on a lowered protein intake and given alkalis. Many, however, admit the failure of these procedures, and

claim that no treatment is necessary unless calculi have been formed. Such a patient should, however, be kept under careful observation. Any abnormal factors in the urinary tract or infective foci in the body which would predispose to urinary infection or calculus formation should be given palliation or correction. Urinary infection should be combated by appropriate measures.

3. Cystine calculi are extremely likely to recur. Surgical intervention, conservative or radical, is our main source of reliance. It may, at times, be most unsatisfactory and discouraging, and recurrences may quickly follow. Dietary control and the use of alkalis internally or by pelvic lavage may be given a trial.

4. Many cases of cystinuria are not recognized. More careful urinalysis is advised in order that cystine crystals may be detected in the urinary sediment. The tests of Brand and Sullivan should be more generally used.

5. The presence of cystine in calculi is frequently unrecognized. All calculi should be subjected to a careful chemical analysis.

BIBLIOGRAPHY

1. BEALE, L. S.: Cystine in the urine successfully treated by large doses of ammonia. *The Lancet*, 1864 2: 303
2. BERZELIUS, J. J.: quoted in Garrod, *loc.*
3. BRAASCH, W. F.: Discussion in *Trans. Am. Ass. G.U. Surgeons*, 1933, 26: 303.
4. BRAND, E.: quoted in Kretschmer, *loc.*
5. CANTANI, A.: quoted in Kretschmer, *loc.*
6. CROWELL, A. J.: Cystine nephrolithiasis. *J. Urology*, 1924, 11: 545.
7. GARROD, A. E.: *Inborn errors of metabolism*. 2nd ed. Oxford Medical Publications, London, 1924.
8. GOTTSTEIN, G.: *Handbuch der Urologie*, Julius Springer, Berlin, 1927, 4: 295.
9. GRAVES, R. C.: Diagnosis of shadowless renal calculi. *Ann. Surg.*, 1922, 75: 487.
10. HOLMES, G. W. AND RUGGLES, H. E.: *Röntgen Interpretation*, Lea & Febiger, Philadelphia, 1926, 2-4.
11. KLEMPERER, G. AND JACOBY, M.: quoted in Kretschmer, *loc.*
12. KRETSCHMER, H. L.: Cystinuria and cystine stones. *Trans. Am. Ass. G.U. Surgeons*, 1933, 26: 241.
13. KÜSTER, E., quoted in Lagues, F.: *Encyclopédie d'urologie*, Octav. Dion & Fils, Paris, 1914, 2: 536.
14. LAMY, A.: quoted in Pousson and Carles, *loc.*
15. LEWIS, H. B.: quoted in Kretschmer, *loc.*
16. NAKANO, H.: quoted in Kretschmer, *loc.*
17. POUSSON, A. AND CARLES, J.: *Encyclopédie d'urologie*, Octav. Dion & Fils, Paris, 1914, 2: 472.
18. RABINOWITCH, I. M.: Personal communication.
19. REAVES, J. U.: Treatment of cystine stones. *South. M. J.*, 1923, 18: 599.
20. ROBSON, W.: Protein metabolism in cystinuria. *Brit. J.*, 1929, 23: 138.
21. SULLIVAN, M. K.: quoted in Kretschmer, *loc.*
22. THIN, R.: Familial cystinuria. *Edinb. M. J.*, 1924, 25: 17.

Philosophy, thou guide of life! Thou searcher after virtue and banisher of vice! What would not only we ourselves but the whole life of men have been without thy aid! It is thou that foundest cities, gatheredst men in social union; thou that united them together first in dwellings, then in the nuptial tie, then in the pleasures

of literature and the interchange of speech; to thee we owe the devising of laws, and thou didst guide men to righteous ways and virtuous habits. To thee we come for refuge; from thee we seek for help. One day well spent according to thy precepts is preferable to an immortality of sin.—Cicero.

XANTHOMATOSIS AND THE SCHÜLLER-CHRISTIAN SYNDROME: A ROENTGENOLOGICAL AND CLINICAL STUDY*

By SAMUEL REICH, M.D.,

Vienna

XANTHOMATOSIS is of special interest to the roentgenologist because both its diagnosis and treatment lie in his hands. Inasmuch as only 55 cases of this disease are recorded in the literature the description of every new case, with its peculiarities, is of value in adding to our knowledge.

CASE REPORT

A boy, aged four years, was sent from the Department of Pediatrics of the Royal Victoria Hospital for examination of his skeleton, with the report—"Peculiar posture and bad gait."

X-ray findings.—"Multiple cystic rarefactions in each os ilium, in each os pubis, in the epiphysis (head) of the left femur, in the shaft of each femur, in the epiphysis of the head of the left humerus, and in the shaft of the right humerus. The defects of the bones are sharp but irregularly limited. They are centrally located, extending to the cortex, but not penetrating it. The periosteum shows no reaction. The picture resembles osteitis fibrocystica-Recklinghausen. (See Figs. 1 and 2). The picture of the skull shows many irregular map-like defects in the vault. The defects of the bones have the appearance of operative defects. (See Fig. 3). The sella is eroded. There are no changes in the bones of the jaw."

* From the X-ray Department of the Royal Victoria Hospital, Montreal, Dr. A. H. Pirie, Director.

These findings caused Dr. Pirie to suggest the diagnosis of xanthomatosis. The clinical features and the comparison with the literature confirmed his opinion.

Personal history.—The child's birth was normal; development until two years of age, normal; no children's diseases. For the last two years he had developed poorly, had lost his appetite, and did not play with other children. A discharge from both ears and diabetes insipidus developed.

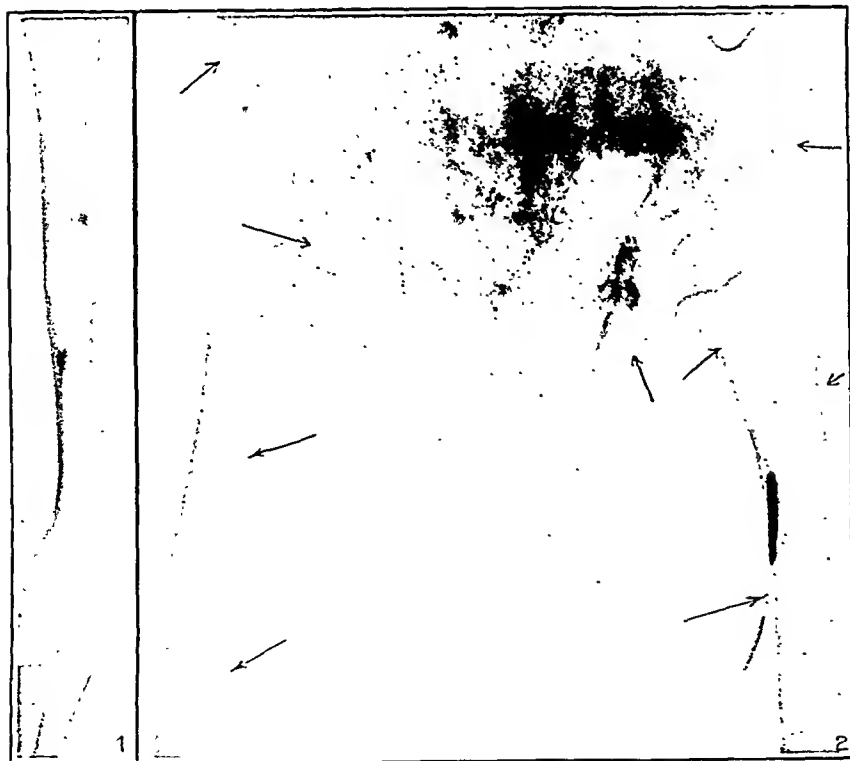
Physical examination.—The patient showed a peculiar posture and a bad gait. He kept his vertebrae stiff and limped slightly, but both extremities were equal. The bones did not show any pathological changes and were not tender. In the skin of the nose, face, extremities, and trunk were multiple small yellow-brown nodules, probably xanthoma tuberosum. The head of the patient was slightly larger than normal; the fontanelles were closed. There was no craniotabes; no exophthalmos. Discharge from both ears, and decay of the teeth and soft gums were noted. There was slight enlargement of the lymph glands. The lungs and heart were normal; the spleen and liver, not enlarged. The bones did not show anything pathological. The Wassermann test was negative. There was no reaction to 1 mg. of tuberculin. Urine normal. The Bence-Jones albumose test was negative. The blood showed slight hypochromic anemia, otherwise negative; hemoglobin, 70 per cent; erythrocytes, 3,800,000. The cholesterol in the blood was 140 mg. per cent (normal).

Summary.—The patient showed defects of the membranous bones, defects in the long bones, diabetes insipidus, and xanthoma tuberosum of the skin. One main symptom of the Schüller-Christian syndrome, exophthalmos, was absent. In addition, otitis and stomatitis, with a general enlargement of the lymph glands, were present, which symptoms frequently occur in xanthomatosis.

REVIEW OF THE FIRST CASES OF CHRISTIAN, SCHÜLLER AND HAND

The first case was reported by Hand¹ in the year 1893 under the title "Polyuria and Tuberculosis".

The patient, a boy three years old, showed diabetes insipidus, exophthalmos, a papular eruption of the skin, bronzed skin, enlarged spleen and liver. He died from bronchopneumonia. The autopsy disclosed yellow nodules in the skull and liver.



Hand examined these and diagnosed tuberculosis, but he was not satisfied with his own diagnosis. He considered the disease to be a tuberculous granuloma of the bones which caused dyspituitarism by its localization near the hypophysis. He was therefore nearer to the reality than Schüller and Christian by whom the disease was named.

The first x-ray pictures showing the typical map-like defects of the skull were taken by Schüller² in Vienna.

His first patient was a boy, 16 years of age, with dystrophia adiposo-genitalis, diabetes insipidus, exophthalmos, and discharge from the right ear for the previous four years. The x-ray picture showed typical defects of the membranous bones of the skull.

Schüller assumed a tumour or angioma of the base of the skull near the sella to be the cause of the syndrome.

His second patient was a girl, 4 years of age, with exophthalmos, diabetes insipidus, and roentgenological defects of the membranous bones of the skull.

He now diagnosed an anomaly of the skeleton resulting from dyspituitarism. He reversed the causality, considering as primary the dyspituitarism, which caused the decalcification of the bones.

Christian³ joined in this wrong opinion. He reported in the Osler Memorial Volume, 1919, a case under the title "Defects in membranous bones, exophthalmos and diabetes insipidus: an unusual syndrome of dyspituitarism: a clinical study".

His patient, a girl, 5 years of age, presented loose teeth, diabetes insipidus, exophthalmos of the right eye, and roentgenological defects of the membranous bones of the skull. The sella was also involved.

Christian summarizes all the previous reported cases and defines the disease by the syndrome: defects of the membranous bones, diabetes insipidus and exophthalmos, caused by the disturbance of the internal secretion of the hypophysis. The dyspituitarism is in his opinion primary. Shortly afterwards Hand⁴ published another case and criticized in his article Christian's opinion under the title "Defects of

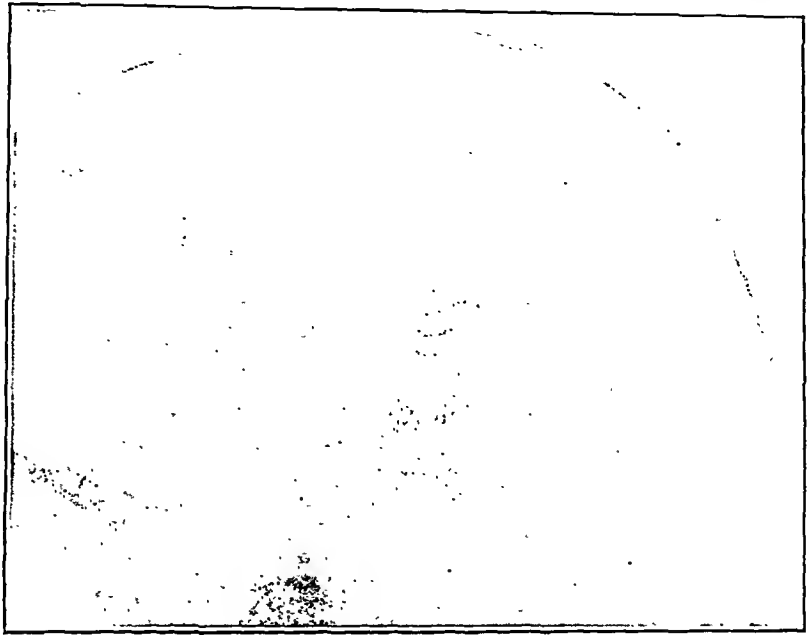


Fig. 3

membranous bones, exophthalmos, and polyuria in childhood—Is it dyspituitarism?"

His patient, a boy, 7 years of age, showed exophthalmos, more marked on the left side than on the right, and pronounced defects of the membranous bones of the skull, but the sella was not involved and the patient did not show diabetes insipidus.

Hand pointed out that the change in the bone affects the hypophysis and causes diabetes insipidus, and that it is not the dyspituitarism that causes the change in the bones. In his own case the hypophysis was not affected, and therefore there was no diabetes insipidus.

ANATOMICAL AND HISTOLOGICAL CONSIDERATIONS

The following two cases are important for their anatomical findings.

The patient of Griffiths,⁵ and of Weidman and Freeman,⁶ (Case 2), a boy of 9 years, had multiple nodular xanthomas of the skin, jaundice, defects in the skull, diabetes insipidus, and exophthalmos. The autopsy showed yellow nodules, 6 to 20 mm., involving both tables of the skull. The same changes were present at the base of the skull, involving the sinus cavernosus, the ganglion Gasserii, and the carotis. The base of the brain between the chiasm and the corpus mammillare, with the posterior lobe of the hypophysis, was infiltrated. The pineal gland was enlarged and infiltrated. Changes of the same nature were present in the lungs. The parenchyma and pleura showed diffuse fibrosis, with yellow patches and storage of lipid in the septa between the alveoli, which were thickened and infiltrated by lymphocytes. The hilus of the liver was infiltrated, and both hepatic ducts were compressed, thus causing the jaundice.

Microscopic examination showed inflammatory fibrous tissue with much lipid. The authors thought it was secondary storage of lipid in syphilitic form.

A similar case was described by Thompson, Keegan and Dunn.⁷ They proved that the exophthalmos was caused by infiltration of the orbits.

Infiltrations were found in the skull, in the petrous part of the mastoid, in the mandibles, and in the sphenoidal and ethmoidal sinuses. The sella was free, but the posterior lobe of the hypophysis, the infundibulum, and tuber cinereum were infiltrated, causing diabetes insipidus. There were defects in the scapulae, clavicles, humerus, ribs, lumbar and cervical vertebrae. The lung showed fibrosis and infiltration with mononuclear and polymorphonuclear cells in the septa between the alveoli.

Microscopic examination.—Inflammatory connective tissue with lipid cells ("foam cells") partly becoming giant cells, plasma cells, lymphocytes, polymorphonuclear and eosinophile cells.

Rowland⁸ was the first to suggest, in the case of Weidman and Freeman with the xanthoma of the skin, that the changes in the bones may be of the same nature as those in the skin, and to assert that the Schüller-Christian disease is a xanthomatosis of the bones. He could then prove by an autopsy in one of his own cases that the lesions in the bones and lungs consist mainly of xanthoma cells. The name of "xanthomatosis" for the disease was also suggested by him.

The xanthoma cell is a cell of reticulo-endothelial origin, with many lipid drops in its protoplasm. In fixing the fat is dissolved away and the cell gets a foamy structure; therefore it is also called "foam cell" (Schaumzelle). Accumulations of such cells occur frequently in the skin, being a harmless anomaly. They form little yellow plaques or nodules (xanthoma planum; xanthoma tuberosum). Most frequent is a single plaque in the eyelid, called xanthelasma. The xanthoma also occurs as an eruption in diabetes and jaundice. Further, it has been met with as xanthoma of the tendon sheath, which sometimes extends to the bone. Xanthoma cells in the internal organs, in the mucous membranes, and in the marrow of the bones, without any clinical symptoms, had been reported by different authors previously.

The nature of the disease depends upon the consideration of the xanthoma cells. Virchow considered them to be tumour cells and the xanthoma to be a tumour. In most books on pathological anatomy the xanthoma is described next the lipoma. The lipoma is a simple fat tumour, and the xanthoma is a fat tumour with doubly refractive (anisotropic) fat (lipoid). According to this opinion, xanthomatosis ought to be a tumour-like disease of the bony system.

Many authors, however, doubt that the xanthoma cell is a tumour cell, and consider xanthomatosis to be an inflammation and the xanthoma a granuloma—thus, Bonhomme, Flessig, Weil, Seyler, Marchand, Kitsch, Anders, Spiess, Berti, Wustman, Dunn, Mason and Wollston, Land, Hauptl, Chester. Finally, Anitschkow⁹ succeeded in transforming vitally stained reticulo-endothelial cells into xanthoma cells by feeding or injecting rabbits with cholesterol. So he refuted the theory as to the tumour nature of the xanthoma cell, because a tumour cell always originates by division (karyokinesis) of an old tumour cell, while the xanthoma grows by the accretion of new cells from outside to the mass. The reaction to the noxious substance we call inflammation. According to this view, xanthoma is a granuloma like the tuberculoma or syphiloma, and xanthomatosis is an inflammation. Chester¹⁰ therefore proposes to change the name "xanthoma" which connotes "tumour", to "lipoid granuloma". He summarizes all the previous histological findings, adding 2 cases of his own, and describes the lipid granuloma (xanthoma) as follows. "There are three elements in the lipid granuloma: (1) lipid cells, which are the specific part of the granuloma; (2) exudate cells which are the reaction of the tissue to the presence of noxious lipoids; (3) connective tissue which acts in healing of the lipid granuloma."

The lipid cells are large globular mononuclear cells with foamy protoplasm, in the spaces of which lies the lipid. There are also polymorphonuclear lipid giant cells. The lipid in the cells is partly isotropic and partly anisotropic, and stains with Nile blue sulphate, partly pink, partly violet, and partly blue. The cells are round when they are lying separate, but when in dense masses they lose the cell walls and fuse into a syncytium. At the same time the nuclei begin to disappear. In this way the lipid cells decrease.

The exudate cells consist of lymphocytes, plasma cells, eosinophiles, and mobile histiocytes. They never contain lipid.

The connective tissue includes fine fibroblasts and blood capillaries, shrinking fibrous scars, and connective tissue between these extremes, depending upon the age of the lipid granuloma. Recent forms of the lipid granuloma consist mainly of lipid cells; in the later stages the exudate cells prevail and the lipid cells are

disappearing. Finally, both the lipid and exudate cells are absent, and the lipid granuloma consists exclusively of fibrous tissue. Thus, xanthomatosis corresponds exactly with the idea of a specific inflammation like tuberculosis, rhinoscleroma or leprosy, the difference being that it is a non-infectious non-bacterial inflammation. A reticulo-endothelial cell phagocytes drops of lipid and is transformed into a xanthoma cell, just as a cell of reticulo-endothelial origin phagocytes the lepra or rhinoscleroma bacillus and is transformed into a specific Virchow lepra cell or Mikulicz rhinoscleroma cell. Exudation of cells and fibrotic regeneration complete the picture of inflammation. Thus the lipid granuloma is a non-bacterial specific inflammation caused by noxious lipoids.

X-RAY AND DIFFERENTIAL DIAGNOSIS

The lipid granuloma attacks by preference the vault of the skull, causing map-like, irregular, but sharply delimited, defects, one of the classic symptoms of the Schüller-Christian triad (map-like skull, diabetes insipidus and exophthalmos). (See Fig. 3). Further, the base of the skull is involved, and frequently the sella is destroyed, which explains the diabetes insipidus; the walls of the orbits are infiltrated and this causes the exophthalmos. The petrous bones, the mastoid, and the jaws show more diffuse, less sharply delimited, areas of decalcification; the bones look as if washed out by the rain. There occur also cystic (sharp) areas of decalcification like those in the long bones. At the roots of the teeth rarefactions and cysts are sometimes found, like an abscess or like epulis. These are the cause of stomatitis, loss of teeth, and deafness, which frequently occur as additional symptoms of xanthomatosis. The bones of the pelvis, ribs, the vertebræ, the scapulæ, and the long bones show multiple central cystic rarefactions which extend to the compact bone, thinning it considerably. (See Figs. 1 and 2). Sometimes the cysts are so numerous that the bones have the appearance of a sliced tomato. They are located in the epiphysis as well as the diaphysis. Pathological fractures occur spontaneously, but they heal. The bones do not show any considerable expansion, no bending, no disturbance in growth of the neighbouring parts, and no fibrous decalcified masses such as occur in osteitis fibrocystica-Recklinghausen or

in enchondroma. An extended sclerosis of the bones may also occur, which makes them structureless, especially in the old forms of xanthomatosis. X-ray pictures of this *in vivo* I have not been able to find. As a matter of fact, the clinicians have not yet observed one case of pronounced sclerosis of the bones in xanthomatosis. On the other hand, Chester examined 12 cadavers with xanthoma of the skin for lipid granuloma of the bone. Two had xanthomatosis of the bones and both showed sclerosis. Case 1 had pronounced manifestations; Case 2 showed slight sclerosis. Additional cases of sclerosis of the bone and xanthomatosis are reported by Hoefer, Slauek, Donnelly. This proves the sclerosis is not so rare as might be concluded from the fact that it has been rarely observed clinically, but the reason is that the clinician observes recent cases only, with acute symptoms, and considers only Schüller-Christian disease as xanthomatosis; he fails to diagnose the cases without a syndrome. Likewise, the roentgenologist never thinks of lipid granuloma when finding accidental sclerosis of a long bone without any clinical symptoms. Therefore I wish to point out once more the necessity of thinking of a healed lipid granuloma when sclerosis of the bone of unknown origin occurs, and of making pictures of the whole skeleton in order that possible defects in other parts of the bones may be disclosed. The fully developed syndrome of the Schüller-Christian disease is easy of diagnosis by every one who knows the symptoms. But forms of xanthomatosis of the long bones which do not involve the skull and do not exhibit the syndrome of Schüller-Christian disease are not extremely rare. So, for example, Kienböck and Schneck,¹¹ in Vienna, describe a similar case with pathological fracture of the humerus.

An adult patient fell and suffered a fracture of her forearm. An x-ray picture showed a spontaneous fracture in a pathologically changed bone. The whole humerus was full of cysts. X-ray, further, showed the same changes in all the other long bones. In the right forearm the cysts were so numerous that the bone had a tomato-slice appearance. The bones of the skull were free from changes. Diabetes insipidus, exophthalmos, and other clinical symptoms were lacking. The wrong diagnosis, osteitis fibrocystica generalisata-Recklinghausen, was made.

A similar case was described by Kienböck and Moworach.¹² In the sister of Herzenberg's patient defects of the long bones were found without the Christian-Schüller syndrome. Sosman¹³ describes a case of lipid granuloma of the tendon-sheath, with roentgenological de-

later, showed definite healing of the defects in the right frontal area, while the non-treated defects in the left parietal bone had increased in size.

The patient of Kartagener and Fischer was a man 21 years of age, with diabetes insipidus, exophthalmos, defects in the bones of the skull, in the vault and in the base. The jaws were reduced to a narrow strip of chalk (calcium); there were defects in the bones of the pelvis, ribs, and in the long bones. The x-ray picture showed the typical small spotted (stippled) lung, as in miliary tuberculosis. The treatment was carried out by Prof. Schinz. He applied three times 300 r to each focus in the bone, using a tension of 160 kv. peak and a filter of 0.5 mm. copper, *halbwertschicht* in copper, 0.58 mm.; target skin distance was 40 cm. The left lung only was irradiated and the right semi-thorax strictly covered, to control and compare the effect of the irradiation with the non-treated side. Five treatments of 240 r each were applied to the back of the left semi-thorax and the same amount to the front of it, making a total of 2,400 r. In the irradiation of the lung 180 kv. peak and 1 mm. copper filter was used. *Halbwertschicht* was 1.1 mm. copper, skin focus distance 63 cm. X-ray therapy was begun on December 12, 1930, and was continued until May 23, 1931, when the patient was discharged. The pathological changes in the lungs and in the long bones were unaltered. On the other hand, the x-ray picture of the skull showed a distinct decrease of the defects. The x-ray finding of the jaw was unchanged, and the base of the skull was found equally unchanged.

Finally Dalitsch reports the good effect of x-ray treatment in a case of xanthomatosis in an adult patient. Rowland, who was the first to discover the correct nature of xanthomatosis, and has observed many cases of his own, in a personal interview expressed the opinion that the changes do not respond to x-ray treatment; at least he did not see any benefit from it, but an illusion of effect is produced by spontaneous remissions which occur very frequently in this disease. He showed many x-ray pictures with spontaneous remissions until definite healing and normal structure of the bone, and x-ray pictures of treated cases without any changes in the defects resulting.

SUMMARY OF THERAPY

It is difficult to judge the value of x-ray treatment because of frequent spontaneous remissions in the disease. Further observations are still necessary. But apparently acute gingivitis and loosening of the teeth respond best to x-ray treatment. The hypophysis also responds well if it is not entirely destroyed by lipoid granuloma, but it is hindered in its function. The diabetes insipidus decreases; development and puberty, if disturbed, become normal. Next to respond to the treatment are the defects in the skull. The changes in the long bones also respond well, but not so promptly as the changes

in the cranial vault. The changes in the lung apparently do not respond at all; at least the x-ray picture of the lung is unchanged. This fact may be explained because the changes in the x-ray picture are not produced by an accumulation of xanthoma cells in the lung but by a secondary fibrosis, namely, by multiple small nodules consisting exclusively of connective tissue, which properly are scars after lipoid granuloma. But is it possible, in spite of the unchanged x-ray finding, that the recent, not yet fibrosed, lipoid granulomatous focus reacts well to irradiation, and the progressive fibrosis of the lung is arrested? It is possible, we think, that x-ray treatment of the lung meets a vital indication, although no result of the treatment is to be seen in the picture. It has to be considered also that one x-ray treatment of the lung has been observed only, and this in an adult patient who did not respond in general very well to the treatment.

Xanthomatosis in adults does not seem to respond as well to x-ray treatment as in children; either because the power of regeneration of the growing organism is greater, or because xanthomatosis of adults is of longer duration and is characterized by more secondary fibrosis which is resistant to x-ray irradiation. By all means it is desirable that xanthomatosis of the lungs should be treated with x-ray and the results reported. A greater amount of material will enable one to give a definite opinion.

TECHNIQUE

Use deep therapy tension of 160 to 180 kv. peak and heavy filter of 0.5 mm. copper. For superficially situated changes in the bone, as in the cranial vault, use lower tension, 120 kv. peak and lighter filter, 4 mm. aluminum. Apply to each focus in the bone twice 200 r to twice 250 r, with an interval of one week, measured on the patient. If there is no improvement after two months, and the x-ray control does not show any decrease in the lesions, repeat the series with three times 200 r to three times 250 r in one week, and so on, up to the limit of the tolerance of the skin. Treat the foci in the bones, each separately, one after another, and examine the blood. Treat gingivitis and loosening of teeth with irradiation of the bone of the jaw and use a similar dose. For treatment of the hypophysis, use four areas of skin and apply 150 r to each on four consecutive days. If the patient does

not respond to this dose, increase to the limit of the tolerance of the skin. There is no danger of further damaging by x-rays the already disturbed function of the hypophysis, because the hypophysis has been proved to be very resistant to x-ray. In the treatment of tumours of the brain, where the hypophysis has also been irradiated with the largest doses, no damage of the hypophysis by x-rays has been observed. It was also found impossible to disturb the function of the hypophysis of a dog by x-ray irradiation with large doses (Sosman). There is no sufficient experience with irradiation of the lung to recommend any technique in regard to it. Try the above mentioned technique of Prof. Schinz, 240 r five times to the back and to the front. Treat each hemi-thorax separately, first, to control the effect of the treatment and to compare it with the other side, and, secondly, in order not to irradiate too large a skin area at once. With children use slightly less dosage. Frequent examination of the blood is most important here, because large areas of the body are irradiated. It has to be considered also that the normal lung reacts sometimes with extensive fibrosis on x-ray irradiation, as has been observed by the chief of our clinic, Dr. A. H. Pirie, in several cases of carcinoma mammae treated with deep therapy. In judging the results of the x-ray treatment you must not forget that spontaneous remissions occur very frequently in xanthomatosis, and that the defects may disappear entirely.

Therapy other than x-ray has proved entirely ineffective. The results with low fat and cholesterol diet reported by Rowland could never be repeated in any other case. Treatment was also tried with parathyroid, calcium and viganol, because of the extensive decalcification of the bone; insulin (twice 5 units daily), and thyroid to lower the cholesterol level of the blood. Injections of pituitary influence the diabetes insipidus, but they do not influence the changes in the bone, because these are primary and the dyspituitarism is the consequence only of their accidental localization in the sella.

PROGNOSIS

Since xanthomatosis is a granuloma and not a tumour, the prognosis is not hopeless. The patient described by Christian in 1919 is still alive, studying at college. The patient first described by Schüller is also still alive; the de-

fects in the skull have disappeared, but the diabetes insipidus still exists. The mortality in this disease is about 30 per cent. Especially endangered are those with infiltration of the lungs, because the secondary fibrosis often causes insufficiency of the right heart. The disease shows a prolonged course of decades with many spontaneous remissions.

PATHOGENESIS

Rowland adopts the opinion of Pinkus and Pick¹⁴ that the xanthoma (lipoid-granuloma) of the skin is produced by a primary increase of the lipoids in the blood serum; the same for the Schüller-Christian disease. This opinion has since been shared by all other authors. See Sosman.¹⁵ This theory of Rowland has been further developed by Brahm and Pick,¹⁶ who say that it is a disturbance in the cholesterol metabolism in contrast to the Niemann-Pick disease which is a disorder of the phosphatide metabolism (lecithin) and Gaucher's disease which is a disorder of the kersasin metabolism. Pick thus has drawn up the following Schema of the lipid metabolism diseases.

Primary disorders: (1) morbus Christian-Schüller—disorder of the cholesterol metabolism; (2) xanthomatous eruption of the skin—also disorder of the cholesterol metabolism; (3) morbus Niemann-Pick—disorder of the phosphatide metabolism, mainly lecithin; (4) morbus Gaucher—kersasin disorder of the metabolism.

Secondary disorders: in jaundice, diabetes.

A summary of the cholesterol tests of the blood in the cases observed until now gives the following result. The cholesterol level of the blood was increased:

Ilofer, 238 mg. per cent; Sosman, second case, 185 mg. per cent; Chiari, 192 mg. per cent; Hochstätter, 174 mg. per cent; Weidman and Freeman, 397 mg. per cent.

The cholesterol level of the blood was normal or sub-normal in the following cases:

Sosman's third case, 84 to 165 mg. per cent; Chester, 95 mg. per cent; Kartagener and Fischer, 148 to 164 mg. per cent; Kienböck and Schneck, 140 mg. per cent; my own case, 140 mg. per cent.

Eight cases of Schaaf and Werner with xanthomatosis of the skin:

One case—increased cholesterol content of the blood; three cases—normal cholesterol level; four cases—sub-normal.

The normal cholesterol level of the blood is about 140 mg. per cent before a meal.

Since hypercholesterinæmia is otherwise not

so rare, it appears that it is not more frequent in xanthomatosis than in people without xanthomatosis. In this way, the theory of Rowland, that xanthomatosis is caused by a primary cholesterinæmia, is not to be proved. In addition, the attempts to cure xanthomatosis with a low cholesterin and fat diet, as has been recommended by Rowland, have not succeeded. Likewise, the attempts to influence the xanthomatous infiltrations by lowering the cholesterin content of the blood with insulin and thyroid injections were not effective.

But a disorder of the cholesterin metabolism is not necessarily hypercholesterinæmia. The observations of Spranger, Werner and Schaaf suggest the following theory. Xanthomatosis is caused by a disorder of the balance of the fat emulsion in the serum, which causes a separation of cholesterin and fat drops, and deposits the cholesterin in the tissues. Fats are kept emulsified in the serum by cholesterol and its esters. According to the *in vitro* experiments of Spranger, the optimum for the emulsion of fat in water is achieved by a cholesterol-cholesterol-ester index of 40:60. In serum the cholesterol-cholesterol-ester index is about 30:70. If new fat is introduced into the blood the blood adapts itself by increasing its emulsifying power, changing the relation between cholesterol and cholesterol-ester till the stability of the fat emulsion is restored as it was before. But if the blood loses its ability to adapt itself to increased new fat intake, the newly introduced fat separates itself from the blood, drawing with it part

of the fat and of the cholesterin content of the blood. The Bürger test¹⁸ is based on this theory. Test the total fat and cholesterin in the blood before a meal. Give 5 g. of cholesterin in 100 c.c. of olive oil, and test the blood after two, eight and twenty-four hours. Normally, the cholesterin content of the blood increases to double its amount (to 280 mg. per cent). Pathological cases with a disorder in the fat balance show a paradoxical reaction. After the intake of cholesterin, the cholesterin content of the blood, as well as the total fat, decreases greatly. Schaaf and Werner proved a similar reaction in 7 cases of xanthoma with a normal and subnormal cholesterin content in the blood. In the case of Kartagener and Fischer of the Schüller-Christian syndrome, with a cholesterin content in the blood of 140 mg. per cent, their examination had the following result (see attached Table on the Bürger test), which proves that xanthomatosis is not caused by excess of cholesterin content in the blood as Rowland suggested, but by a disorder in the stability of the fat emulsion in the blood. The opinion is correct that xanthomatosis is caused by a disorder of the cholesterin metabolism. The genesis by a disturbance of metabolism does not change the specific granulomatous nature of this particular disease.

SUMMARY

Xanthomatosis is a specific granuloma which is not caused by microorganisms, but by a disturbance in the stability of the emulsion of cholesterin and fat in blood. There is no hyper-

BÜRGER TEST
(AFTER 5 G. OF CHOLESTERIN AND 100 G. OF OLIVE OIL)

	<i>Total Fat Extract Mg. Per cent</i>	<i>Phosphatide Phosphorus Mg. Per cent</i>	<i>Lecithin Mg. Per cent</i>	<i>Cholesterin</i>			
				<i>Total Mg. Per cent</i>	<i>Free Mg. Per cent</i>	<i>Estered Mg. Per cent</i>	<i>Ester Per cent of Total Cholesterin</i>
<i>First Test:</i>							
Before fat meal.	770	10.6	266	148	35	113	76.4
4 hours after fat meal.	825	10.1	252	118	32	86	72.8
8 " " " "	645	9.7	242	143	24	119	83.2
24 " " " "	650	9.7	242	116	34	82	70.6
<i>Second Test:</i>							
Before fat meal.	1285	7.25	182	164	48	116	70.8
1 hour after fat meal.	1305	10.05	252	144	43.5	100.5	69.7
2 hours " " " "	1230	9.2	230	174	56	118	68.4
4 " " " "	1020	9.8	246	171.5	53.5	118	68.7
8 " " " "	890	11.0	277	115.5	41.5	74	64.0
24 " " " "	800	8.35	210	124	40	84	67.7

This analysis shows that the fat meal was absorbed, but in spite of this the total fat and the cholesterin went down.

cholesterinamia. It is suggested that the name "xanthoma", which connotes "tumour", be changed for "lipoid granuloma". Xanthomatosis is defined as general infiltration with lipoid granuloma. The Schüller-Christian disease is subordinated to xanthomatosis instead of being identified with it. Therefore, in my title "xanthomatosis" and "Schüller-Christian syndrome" concerns those cases with defects in the skull and dyspituitarism only.

The x-ray diagnosis, differential diagnosis, treatment and prognosis of the disease are given.

One case of Schüller-Christian disease of my own observation is reported.

REFERENCES

1. HAND, A.: Polyuria and Tuberculosis, *Arch. Pediat.*, 1893, 10: 673.
2. SCHÜLLER, A.: Ueber eigenartige Schädeldefekte im Jugendalter, *Fortschr. auf d. Geb. d. Röntgenstr.*, 1915, 23: 12. Ueber ein eigenartiges Syndrom von Dyspituitarism, *Wien. medicin. Wchnschr.*, 1921, 71: 516.
3. CHRISTIAN, H. A.: Contributions to Med. and Biol. Research, N.Y., Osler Memorial Volume, 1919, 1: 390.
4. HAND, A.: Defects of membranous bones; exophthalmos in childhood—Is it dyspituitarism? *Am. J. M. Sc.*, 1921, 162: 509.
5. GRIFFITH, I. P. C.: Xanthoma Tuberosum with Early Jaundice and Diabetes insipidus, *Arch. Pediat.*, 1932, 39: 297.
6. WEIDMAN, F. D. AND FREEMAN, W.: Xanthoma Taber. Two necropsies disclosing lesions of central nervous system and other tissues, *Arch. Dermat. & Syph.*, 1924, 9: 149.
7. THOMPSON, C. Q., KEGAN, J. J. AND DUNN, A. D.: Defects of membranous bones, exophthalmos and diabetes insipidus, *Arch. Int. Med.*, 1925, 36: 650.
8. ROWLAND, R. S.: Xanthomatosis and the Reticulo-endothelial System, *Arch. Int. Med.*, 1928, 42: 611.
9. ANITSCHKOW, N.: Über vitale Färbung und Cholesterinspeicherung im Organismus, *Med. Klin.*, 1914, 10: 465; *ibid.*, *Archiv. Dermat. und Syph.*, 1914, 120: 627; *Beiträge z. path. Anat. und allg. Path.*, 1913, 57: 201.
10. CHRISTE, W.: Ueber Lipoidgranulomatose, *Virchow's Archiv.*, 1931, 279: 561.
11. KILNBÖCK, R. AND SCHNECK, F.: Ein Fall v. Xanthomatose des Skeletts, *Brun's Beiträge z. klin. Chir.*, 1932, 156: 237.
12. KILNBÖCK, R. AND MOWBRACH, L.: Ein Fall von multiplen Xanthomen in den Knochen, 1932, 4: 76.
13. SASMAN, M. C.: Xanthomatosis, *Am. J. Roentgenol.*, 1930, 23: 581.
14. KARTAGENER, M. AND FISCHER, H.: Untersuchungen über den Lipid und Calcium-Stoffwechsel in einem Fall v. Schüller-Christianscher Krankheit, *Zeitschr. f. klin. Med.*, 1932, 119: 421.
15. CIGNOLINI, P.: Effetti locali e generali della radioterapia in un caso di diabete insipido associato ad osteopatia, *Radiol. med.*, 1929, 16: 16.
16. PICK, L.: Sitzung d. Berliner med. Gesellschaft, *Med. Klinik.*, 1929, 25: 448.
17. SASMAN, M. C.: Xanthomatosis, *J. Am. M. Ass.*, 1932, 98: 110.
18. BUEGLER, M.: Cholesterinhaushalt beim Menschen, *Ergeb. inner Med.*, 1928, 34: 583.
19. BRAHM, H. AND PICK, L.: Zur chemischen Organanalyse bei der lipoidzelligen Splenobepatomegalie, *Klin. Wchnschr.*, 1927, 6: 2367.
20. EPSTEIN, E. AND LORENZ, K.: Zur Chemie der Gewebseinlagerungen bei einem Falle von Schüller-Christianscher Krankheit, *Hoppe-Seyler's Zeitschr. f. physiol. Chemie*, 1930, 190: 44.

COMMON DUCT OBSTRUCTION WITH LIPIODOL STUDIES OF CHOLANGIECTASIS AND THE EFFECTS OF PROLONGED DRAINAGE*

By P. H. T. THORLAKSON, M.D., C.M., M.R.C.S. (ENG.), F.R.C.S.(C.),

Lecturer in Clinical Surgery, Faculty of Medicine, University of Manitoba,

AND

J. C. McMILLAN, M.D., F.R.C.P.(C.), F.A.C.P.,

Lecturer in Medicine (Roentgenology and Electro-Therapeutics)

Faculty of Medicine, University of Manitoba,

Winnipeg

DILATION of the intra-hepatic biliary tract as a result either of calculus or of cicatricial or neoplastic obstruction of the common bile duct has long been recognized and has been referred to as "cholangiectasis". The obstruction leads to a damming back of the bile, and this, in conjunction with co-existing infection, brings about the following changes, viz., a cylindrical dilatation of the common duct and the hepatic ducts, sacculatation of the intra-hepatic biliary system, pressure atrophy of the

parenchymatous liver cells, interference with the portal circulation, cholangitis, hepatitis, and, finally, a general fibrosis of the whole liver, with great impairment of function. The degree and permanence of the functional damage to the liver depend upon the duration and the completeness of the obstruction and the virulence of the infection. The purpose of this paper is to show radiographically the structural changes in the biliary tree in patients suffering from common duct obstruction of varying degree, and to demonstrate the improvement which follows prolonged drainage or drainage with irrigation of the bile passages.

In reviewing the literature on common duct

* A paper read at the Staff Meeting of the Winnipeg General Hospital, November, 1933.

Presented before the Pan-American Medical Association in South America, March, 1934.

dilatation one finds many interesting observations. In 1932, Zinniger and Cash¹ published an exhaustive report on congenital cystic dilatation. They reported a case of their own and found previous reports of 82 cases in which the records justified the diagnosis of congenital cystic dilatation of the common duct.

Dilatation of the biliary passages has been produced experimentally by many observers, and its effect on the liver economy studied. McMaster, Brown, and Rous² reported observations on the changes in the biliary tract following obstructive lesions, and suggested the term "hydro-hepatosis". They demonstrated that the character and colour of the bile depended upon the functional activity of the gall-bladder. If the concentrating and absorptive power of the gall-bladder is normal the bile is dark and thick; if the gall-bladder is not functioning the ducts are filled with so-called "white bile", mostly mucus secreted from the ducts, the bile pigments having been re-absorbed.

An outstanding article by Counsellor and McIndoe³ demonstrated the structural changes which occur in different types of biliary disease. It is illustrated by beautifully prepared casts of the biliary tree in 26 post-mortem specimens. Ten cases had no biliary tract disease and acted as controls. They made careful measurements of the different branches of the duct system and showed the degree of dilatation present. In 8 cases there were stones in the gall-bladder, not suspected before autopsy, and 7 of these showed general duct enlargement. The degree of dilatation seemed to correspond to the severity of the infection and damage found in the wall of the gall-bladder itself. In 3 cases where cholecystectomy had been performed within ten days of death, all showed dilatation of the intra-hepatic bile ducts. In 5 cases in which the obstruction of the common duct was caused by benign stricture or malignant growth the degree of dilatation was marked and the parenchymatous liver damage extensive.

The use of lipiodol as a means of visualizing the bile passages is of quite recent date. Our observations were original with us, but review of the literature showed that somewhat similar work has been carried out by others. However, we can find no record of a series of studies illustrating the changes that occur in severe cases during the course of treatment, especially showing the marked improvement in the intra-

hepatic biliary system which results from prolonged drainage. Gabriel⁴ in 1930 published an article on "Proof of patency of the common bile duct by the injection of lipiodol". R. H. Overholt⁵ in 1931 reported "Biliary tract visualization with radiopaque oil". Ginzburg and Benjamin⁶ in 1930 presented a series of "Lipiodol studies of post-operative biliary fistulae". Lahey⁷ in 1932 reported similar work, and recently Judd and Phillips⁸ have presented a series of cases entitled "The patency of the biliary ducts".

Ginzburg and Benjamin state that in the absence of obstruction distal to the internal opening of the biliary fistulous tract the lipiodol appears almost immediately in the duodenum, and there is no reversal of flow up into the intra-hepatic biliary radicles, and, further, that the presence of obstruction will prevent the entrance of lipiodol into the duodenum and will result in reversal of flow if sufficient lipiodol is used. It is to be noted that these observations were conducted on patients with external biliary fistulae, whereas our observations were made on patients in whom the hepatic arm of the T-tube was lying within the lumen of the common duct.

In our cases the lipiodol passed into the duodenum without delay, but it also ran up into the duct system and outlined the intra-hepatic biliary tree, in spite of the fact that there was obviously no distal obstruction. We feel that *failure to visualize the intra-hepatic system depends upon a widespread cholangitis, and that this cholangitis subsides following prolonged drainage, or drainage and irrigation.* As illustrated by Case 5, the intra-hepatic system will be visualized well as soon as the ducts are cleared of the viscid stagnant contents, and thus visualization indicates improvement following drainage and not necessarily obstruction, as they point out.

RADIOGRAPHIC TECHNIQUE

The foot of the x-ray table (Bucky) is elevated about six inches, in order that gravity may assist the flow of lipiodol into the liver duct system. (This is probably not necessary). The apparatus is set ready to take the x-ray film. A 20 c.c. syringe full of lipiodol is attached to the end of the T-tube, and the oil is injected with a slow steady pressure on the piston of the syringe, taking about 30 to 45 seconds for

the complete injection. The first plate is taken immediately upon completion of the injection. A second plate is taken 20 minutes later.

The following are summarized histories of 5 cases which form the basis of this report, together with the x-ray pictures in each case.

CASE 1

Mrs. A.C.S. Our first observations were carried out upon a female patient whose pre-operative history was briefly as follows. She had had jaundice, which was constant but varied in degree, and repeated colic, associated occasionally with chills. These manifestations followed a cholecystectomy done 18 months previously. The icterus index was 52.

The usual pre-operative preparation of blood transfusion, intravenous calcium chloride, and repeated injections of intravenous glucose, was given. At

operation the supra-duodenal portion of the common duct was found to be replaced by an elongated narrow structure. Above the stricture the common duct was dilated, and both right and left hepatic ducts contained a great deal of biliary mud and many calculi. The duct was repaired over a T-tube. The immediate post-operative course on the whole was uneventful, but the jaundice was slow in subsiding. The biliary passages were irrigated with warm normal saline three times a week after the first week. With each lavage some fine biliary sand and large quantities of mucus came through the tube, indicating the presence of widespread catarrhal cholangitis and stagnation in the sacculated portion of the intra-hepatic ducts.

On the 39th day after operation, 20 c.c. of lipiodol were injected through the T-tube, first to determine the patency of the lower portion of the common duct and to observe the speed with which the opaque solution passed on into the duodenum, and, secondly, to demonstrate, if possible, the presence of any calculi in the ducts that might have been overlooked at the

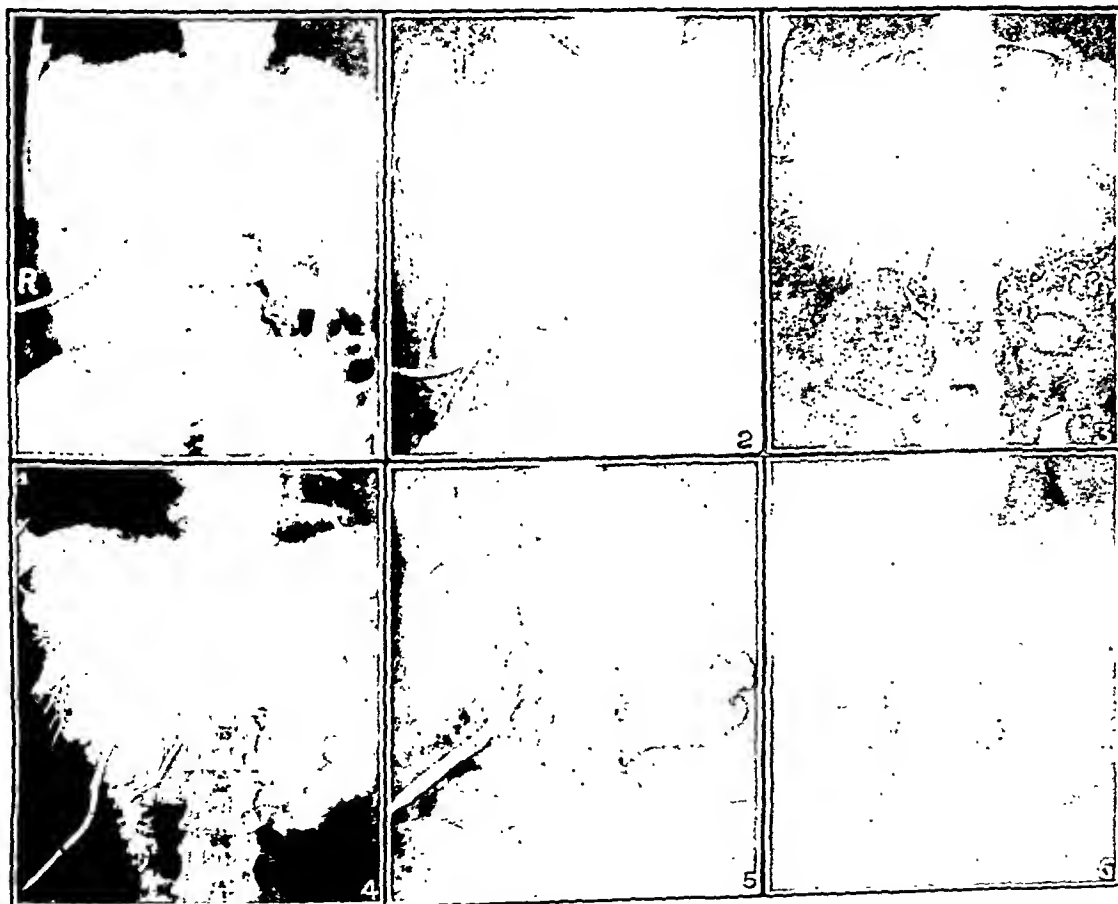


FIG. 1, Case 1 (June 10, 1933).—Marked dilatation of common and hepatic ducts. The hepatic ducts at operation were found to contain large amounts of thick mucus and sand. Very few of the smaller ducts are visualized.

FIG. 2, (Oct. 2, 1933).—Same case as Fig. 1 (3½ months later) showing marked improvement following drainage and irrigation, and excellent visualization of the outermost radicles of the intra-hepatic biliary duct system. The clinical course of this case showed a corresponding improvement.

FIG. 3, Case 2 (June 8, 1933).—Normal biliary tree. No dilatation of the ducts, and excellent visualization of the finer radicles.

FIG. 4, Case 3 (June 2, 1933).—A slight degree of dilatation of the biliary ducts, with non-visualization of the outermost radicles.

FIG. 5, (Aug. 3, 1933).—Moderately advanced dilatation with non-visualization of the greater portion of the intra-hepatic duct system.

FIG. 6, Case 5 (Oct. 4, 1933).—Marked dilatation of the common and hepatic ducts, with practically no visualization of the intra-hepatic ducts.

time of operation. As illustrated in Fig. 1 the opaque solution passed rapidly on into the duodenum and upper jejunum, but only the common and lower dilated and sacculated segments of the hepatic ducts were visualized. We interpreted this as confirming our clinical suspicion that the intra-hepatic biliary tree was filled, and probably plugged, by the products of a chronic biliary inflammation. The drainage and irrigations were continued and the jaundice gradually improved, though there were occasional exacerbations with slight fever, indicating persistent intra-hepatic infection. During the next three months the patient improved so much that at times she was jaundice-free and the irrigations had for some weeks failed to wash out sand and mucus. Fig. 2 illustrates the marked improvement that occurred in the intra-hepatic biliary tree during this period. A comparison between this x-ray plate and that of Fig. 1 shows that now even the finer radicles of the biliary passages are unobstructed. These two plates also demonstrate that the liver is enlarged, and that the intra-hepatic ducts are undoubtedly permanently damaged and dilated. The rapid emptying of the opaque solution into the bowel below indicated that there was no obstruction to the flow through the common duct.

CASE 2

Miss M.R., aged 32. This patient was referred to us because of the fact that she was having repeated attacks suggesting biliary colic (pain, tenderness, and marked rigidity in the upper right quadrant with referred pain to the right subscapular area, and vomiting). Her gall-bladder had been removed previously. There was no history of jaundice, and the icterus index taken during the attack was normal. A thorough investigation proved negative, including a blood Wassermann test. Several consultations were held and she was placed on rigid medical management, without relief. After going into the details of her history and three laparotomies (appendicectomy, cholecystectomy, and Finney), we finally decided to explore the common duct. This appeared normal as to size and thickness, and a probe passed easily into the duodenum. The liver appeared perfectly normal. However, in view of the history and the fact that palpation of the pancreas revealed slight evidence (?) of chronic pancreatitis a small T-tube was placed in the common duct. The patient received absolutely no benefit from this procedure, her pseudo-biliary colic persisting with the tube in the duct. Before withdrawing the T-tube, 20 c.c. of lipiodol were injected, showing not only a perfectly normal biliary tree, but also rapid passage of the lipiodol into the intestine. The lipiodol can be followed into the outermost radicles of the bile ducts. The fact that we are able to demonstrate, radiographically, what we consider to be a normal biliary tree (Fig. 3) is thereby explained.

CASE 3

Mrs. D.D.R., aged 32. The history revealed that a gall-bladder containing calculi had been removed a few months before admission to hospital. Since the operation the patient had suffered a few attacks of colic and jaundice, without temperature, the jaundice subsiding rapidly. With some of the attacks no jaundice had been noted. A pre-operative diagnosis of common duct stone was made. At operation a stricture of the common duct was found at the site where the cystic duct had been ligated; the common duct otherwise was free. The stricture was repaired over a T-tube. Fig. 4 shows the biliary tree three weeks after operation, and illustrates the earliest changes that we have been able to observe. Comparison with Fig. 3 shows that the finer radicles of the ducts are not visualized. There is slight evidence of dilatation. One of the pancreatic ducts is visualized. The opaque medium entered the duodenum without

delay and a film taken 20 minutes subsequent to injection showed almost complete disappearance of the opaque solution from the bile passages.

CASE 4

Mrs. A.T., aged 35. This patient gave a long history of flatulent dyspepsia and slight pain, but no jaundice until six weeks before operation, when she suffered from an attack of severe obstructive jaundice with fever and pain. She was tidied over this attack. Six weeks later, at operation, a thickened inflamed gall-bladder full of calculi was found. The common duct was dilated and contained several calculi with considerable biliary mud. The common duct was drained by means of a T-tube. Fig. 5 illustrates a case with dilatation of the common, right and left ducts, and slight visualization of the intra-hepatic biliary passages. The branches of the biliary tree are cut off closer to the main ducts. This corresponded very closely to this patient's clinical history.

CASE 5

Mrs. L.O., aged 55, had suffered from attacks of epigastric pain for 25 years. She had never been jaundiced. The attacks of pain lasted from 20 to 30 minutes. We were unable to elicit the slightest tenderness in the gall-bladder region, though she was examined immediately after an attack. Her temperature was normal. X-ray investigation revealed the presence of a traction diverticulum of the second part of the duodenum, and the gall-bladder failed to be visualized. At operation a dense mass of adhesions was encountered over the region of the gall-bladder. A small, contracted, thickened gall-bladder was found. The duodenum was adherent and had been tented up by the contracting gall-bladder. The common duct was dilated and contained two calculi and a large amount of yellow-coloured mud. This material was scooped out and the duct washed out with normal saline. T-tube drainage was provided. Visualization of the biliary tree four weeks after operation revealed marked dilatation of the common, right and left bile ducts. Fig. 6 shows the branches of the biliary tree cut off still closer to the main ducts. The dye drained freely into the duodenum.

Our interpretation of the cases showing incomplete visualization of the biliary tract is that the finer radicles are filled with tenacious infected mucus which prevents the lipiodol from spreading freely throughout the smaller bile passages. We feel that in such cases irrigation of the ducts with warm normal saline is indicated, and that this procedure, if carried out with ordinary aseptic precautions, is not attended by any ill effects.

SUMMARY

1. Five cases are presented to show the possibility and the value of x-ray visualization of the biliary passages in common-duct obstruction after drainage has been established.

2. Examination and comparison of the x-ray plates shown illustrate that the x-ray evidence of dilatation of the main ducts and the varying degrees of obstruction of the intra-hepatic biliary passages correspond very closely to the

clinical history and operative findings in each case.

3. This method of investigation is of value in demonstrating the patency of the ampulla of Vater, and in severe cases provides a radiographic record of the improvement that occurs in the smaller intra-hepatic bile ducts during the course of drainage.

4. No toxic symptoms have been noted in any of our cases from the lipiodol. In one case 40 c.c. of lipiodol were injected without any harmful effects.

5. One of us (J.C.McM.) was struck by the radiographical similarity between this condition and bronchiectasis. Taking into consideration also the nature of the retained secretions within the dilated and sacculated ducts in the presence of infection, we feel that the term "cholangiectasis" is more appropriately descriptive of the condition than the term "hydro-hepatosis".

6. The cases presented in this paper illustrate one type of cholangiectasis. There is another form which develops as a result of gradually increasing obstruction such as we have with carcinoma of the head of the pancreas. In this

condition both extra- and intra-hepatic ducts become enormously enlarged and sacculated. As the obstruction becomes complete the contents of the bile passages are altered and instead of bile we encounter a watery mucinous material. Infection is absent or is a negligible factor in these cases. There are, therefore, two distinct types of cholangiectasis met with by the surgeon in dealing with common duct obstruction. We propose the following nomenclature to describe these types: (1) Chronic non-infective cholangiectasis (mucinous). (2) Chronic infective cholangiectasis (calcareous).

REFERENCES

1. ZINNINGER, M. M. AND CASH, J. R.: Congenital cystic dilatation of the common bile duct, report of a case and review of literature, *Arch. Surg.*, 1932, 24: 77.
2. McMANTLE, P. D., BROUN, G. O. AND ROUS, P.: Studies on the total bile, on the bile changes caused by a pressure obstacles to secretion and on hydrohepatosis, *J. Exper. Med.*, 1923, 37: 685.
3. CORNSILLOR, V. S. AND MCINDOE, A.: Dilatation of the bile ducts (hydrohepatosis), *Surg., Gyn. & Obst.*, 1926, 43: 729.
4. GABRIEL, W. B.: Proof of patency of the common bile duct by the injection of lipiodol, *The Lancet*, 1930, 1: 1014.
5. OVERHOLT, R. H.: Biliary tract visualization with radiopaque oil, *Surg., Gyn. & Obst.*, 1931, 52: 92.
6. GINSBURG, L. AND BENJAMIN, E. W.: Lipiodol studies of post-operative biliary fistula, *Ann. Surg.*, 1930, 91: 233.
7. LAHEY, F. H.: Common and hepatic duct stones, *New Eng. J. of Med.*, 1932, 207: 685.
8. IRWIN, E. S. AND PHILLIPS, J. R.: The patency of the biliary ducts, *Surg., Gyn. & Obst.*, 1933, 57: 668.

GONOCOCCAL ENDOCARDITIS*

By W. W. EAKIN, M.D., F.R.C.P.(C.),

Montreal

THE cardiac complications of gonococcal infection are well known—a general septicæmia causing an endo-, myo- or peri-carditis. The fever is high, remittent in type, and embolic phenomena are common. The average duration of the illness is four to ten weeks. In contrast to the prevalence of urethritis, however, it would appear to be of rare occurrence; as yet there are less than 100 proved cases reported in the literature.

In a review in 1922, Thayer¹ reported 72 cases of gonococcal endocarditis which had appeared in the literature. To these he added 12 of his own. His conclusions were that it was a grave, though not an infrequent malady; in 176 cases of acute endocarditis of determined origin, 20, or 11.3 per cent, were gonococcal in origin. The aortic valve in his own series was

the one most frequently involved; the pulmonary next, the predominance of aortic involvement being greater in all the reported cases, forming 70 per cent.

In 1932, Hoffman and Taggart² discarded some of the cases which had previously been reported, on the grounds of insufficient diagnostic evidence. These authors added another case and reviewed 8 others which had subsequently been reported; they state that the total number reported is 76 proved cases. They agree with Karsner³ that the diagnostic criteria must demonstrate the presence of gonococci in the blood or lesion, to be accepted as such.

In this hospital, during the past 16 years, of 91 cases of acute bacterial endocarditis, 4 were gonococcal in origin, though 2 must be discarded as not being proved. One of these was that of a girl of 18 who developed an acute vaginitis, and one week later gonococcal arthritis and endo-

* From the Department of Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal.

carditis. Autopsy revealed an ulcerative endocarditis of the mitral valve, ulcerative arthritis of the right knee joint, an exudative purulent arteritis of the left common iliac artery together with thrombus formation at the lower end of the aorta and the beginning of the right and the left common iliac arteries. Blood cultures during life were negative, and bacteriological studies at autopsy did not demonstrate gonococci.

The other two cases were both detected in 1933 and are herewith reported.

CASE 1

A male, aged 29 years, a hairdresser.

Complaints.—Chills. Palpitation. Gonorrhœa for five months.

History of illness.—The patient was perfectly well until June, 1933, when, three to four days after exposure, he developed gonorrhœa. He consulted his physician who prescribed urethral injections, which were to be retained for ten minutes. In three to four weeks he was greatly improved, the discharge lessened, and the injections were used only twice daily. During the following three months there was no dysuria and the discharge was noted as only a small drop in the morning. At the end of August, 1933, he was considered cured. During this time, he had felt well. Within a few days, however, the discharge reappeared and he consulted another physician who gave him prostatic massage and irrigations twice a week. On September 20, 1933, he developed an orchitis on the left side. Caprikol capsules were given, the patient remained in bed, and the swelling gradually disappeared. Two weeks later, prostatic massage and irrigations were recommenced. Shortly after returning to work, early in October, 1933, he noticed the occurrence of chills. These occurred twice a day, usually in the morning about eleven o'clock, and would last two to three hours, following which he would perspire a great deal. During this time, the patient felt weak, but he attributed this to his stay in bed and to the fact that he had developed a "cold". He stated, however, that since September 1st he had been losing weight, had suffered from occasional night sweats and malaise, and also had noticed progressive pallor. He continued at work however, until the latter part of October, when he took to bed, complaining of chilly sensations and palpitation. At this time an aortic murmur was noted, which, during the following days appeared to increase in intensity. He was seen in consultation on November 2, 1933, and was admitted to this hospital.

Family history.—Irrelevant.

Personal history.—He had had mumps, scarlet fever and influenza some years previously. There was no history of rheumatic fever, tonsillitis, or of heart disease. He had had a previous attack of gonorrhœa in 1929, which, he stated, cleared up in three weeks' time.

Physical examination on November 2, 1933, showed no acute distress. There was a marked pallor of the skin. There was no clubbing of the fingers, and no petechiæ were present. Marked pulsation in the carotid arteries and capillary pulsation was observed. There was no evidence of increase in venous pressure; no œdema. Temperature, 104°. The pulse was regular, collapsing in character; no arterial thickening. Blood pressure 100/30; equal in both radials.

Over the apex and mid-precordium a short presystolic thrill was palpable. The heart was not enlarged. The sounds were of good quality, well heard

at all areas. At the apex a rough presystolic murmur lead up to an accentuated first sound, which, in turn, was followed by a blowing systolic murmur transmitted to the axilla. At the base, and most intense over the aortic area, blowing systolic and rough diastolic murmurs were heard, the latter transmitted to the vessels of the neck and down the left border of the sternum.

The lungs were clear. The liver and spleen were not enlarged. The left testicle was slightly enlarged. The prostate per rectum was not enlarged or tender. A smear from the prostatic fluid showed no gonococci.

Laboratory examination.—Urinalysis.—The urine showed a specific gravity of 1024. Neither albumin nor sugar was present. Microscopic examination revealed nothing abnormal. Two days before death, a heavy trace of albumin was noted for the first time.

Blood count.—Red blood cells 3,350,000; white blood cells 11,200; hæmoglobin 51 per cent. Blood Wassermann test, negative; gonococcal fixation, 4 plus. Blood culture.—(By Dr. D. H. Smith, of the Department of Bacteriology). After several negative results, gonococci were isolated on blood culture.

X-ray film, made at six feet, showed the heart to

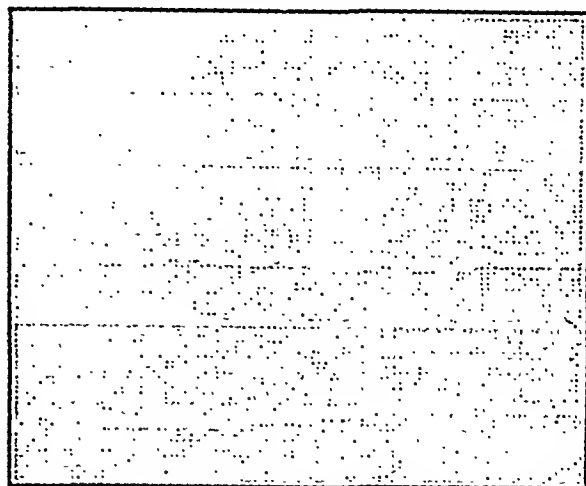


FIG. 1. Case 1.—Electrocardiogram showing definite prolongation of the P-R interval. 0.28 secs.

be normal in size and shape (mid-left diameter 9 cm.; mid-right 4 cm. Internal diameter of the thorax, 23.5 cm.). The aorta and diaphragm appeared to be normal. The lung fields were clear.

The electrocardiogram (Fig. 1) showed definite prolongation of the P-R interval (0.28 seconds).

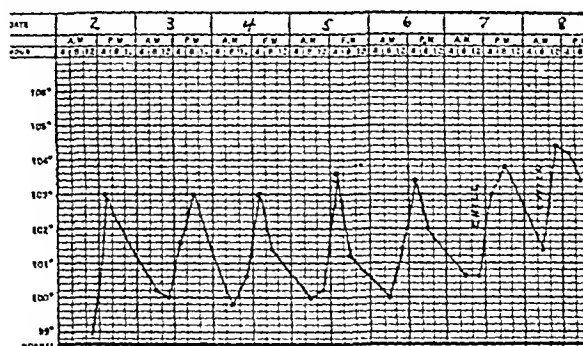


CHART 1. Case 1.—Remittent fever.

Progress.—Fever of the intermittent type continued, ranging from 100 to 104°. He had chills, lasting, on the average, about one-half hour.

Examination of his fundi, by Dr. F. T. Tooke, on November 21st was as follows: "The right eye shows a very well marked flame-shaped hæmorrhage running obliquely from the lower disc margin down to the

temporal side. It is about the length of a disc diameter, and is associated with the wall of one of the venous capillaries. It is relatively recent. Both fundi are normal in all other respects."

On November 27th morphological blood examination (abbreviated) by Dr. J. Kaufmann was as follows: "Red blood cells 3,200,000; white blood cells 26,000; hemoglobin 51 per cent; colour index, 0.81. The blood picture shows a quite marked anemia due to reduction in the red cell count and lowering in the hemoglobin concentration. The fragility of the erythrocytes is moderately increased, and this, with moderate bilirubinemia, indicates that hemolytic factors are probably playing a rôle in the production of the anemia. The sedimentation velocity is markedly increased. The white cells show a marked leucocytosis, due to an increase in polymorphonuclears, with decrease in nuclear segmentation and toxic changes in their cytoplasm. Eosinophiles are absent and the monocytes and lymphocytes show a relative and absolute reduction. This picture is that met with at the height of infection. The platelets are moderately reduced and there is considerable hydraemia."



2



3

FIG. 2. Case 1.—Endocarditis and ulceration involving aortic valve and undefended space.

FIG. 3. Case 1.—Right side of heart showing ulceration extending through the septum to the tricuspid valve.

The patient's condition continued with daily chills and fever. At no time was enlargement of the spleen noted or petechiae observed. The diastolic murmur became somewhat more intense at the base. On November 28th, he became very dyspnoeic, which symptom increased in severity until his death the following day, November 29, 1933, twenty-seven days after his admission to the hospital and approximately six weeks after the onset of his cardiac condition. A diagnosis was made of gonococcal septicæmia and acute gonococcal aortic endocarditis.

Autopsy.—Permission for autopsy on the heart only was obtained. A section was also obtained from the spleen.

Heart.—Weight 370 gm. There were petechial hemorrhages on the posterior surface of the left ventricle. On the pericardium there was an area of petechial hemorrhages, about 3 cm. in diameter, over the posterior part of the base of the left ventricle. There were a few similar patches over the apex of the right ventricle. These were confined to visceral pericardium. The myocardium was pale reddish-brown. The left ventricle was moderately dilated, 1 cm. thick and uniformly firm. The papillary muscles were of normal size, pale grey, with mottled reddish areas. Chordæ tendineæ were slightly thickened and shortened; aortic valve, 5 cm. Involving the coronary free cusp there was a large polypoid mass which almost completely replaced it. This was 3 cm. long and extended into the cavity of the left ventricle. It was firm, dark and pale grey. There was extensive ulceration extending down from the free margin of the cusp to involve the undefended space. This was about 2 cm. in diameter. The polypoid mass filled the ulcerated area, extending through to the adjacent tricuspid valve on the right side, and was round and elevated, 2.5 cm. in diameter, and about 1 cm. above the endocardial surface. At the level of the tricuspid there was a small pale grey polypoid mass the size of a pea attached to the right coronary cusp of the aortic valve in the position of the corpora Arantii. The left coronary cusp was free and well preserved. Mitral valve, 8 cm. There was slight uniform thickening of the endocardium of the left auricle. Tricuspid, 10 cm.; pulmonary, 5 cm.

Microscopic examination.—Sections from the vegetation from the aortic valve showed masses of fibrinous material which were slightly laminated. At the periphery there were areas of leucocytes. Gram stain showed scattered Gram-negative diplococci. In some places these were intracellular, but in most areas no definite organisms were found. Diagnosis.—Fibrinous endocarditis (gonococcal).

Myocardium.—There were a few small foci of leucocytes. The muscle fibres in these areas were degenerating. There were no thrombosed vessels. Diagnosis.—Focal exudative myocarditis.

Spleen.—The pulp contained numerous plasma cells and large mononuclears. There was slight proliferation of the reticulum.

CASE 2

A female, married, aged 32, housewife.

Complaints.—Pain, redness and swelling of the right wrist and both ankle joints. Pain in both knees; chills and fever.

History of illness.—The patient had been perfectly well until eleven days before admission, at which time she had just returned from a vacation. After carrying her bag through the station she noticed on returning home that the right wrist was swollen and acutely painful. The following day, September 4, the right ankle became swollen and acutely painful, and she was forced to remain in bed. The following day, the left ankle became swollen, though the wrist was somewhat improved. Since the onset of the condition she had had frequent chills and had continued to run a fever. She was admitted to hospital on September 14, 1933.

Family history.—Irrelevant.

Personal history.—There was no previous history of rheumatic fever or of heart disease.

Physical examination on admission revealed a temperature of 102°. The respirations were shallow, rapid, 42 per minute. She was in acute distress, perspiring freely, with large drops of perspiration on the skin. There was extreme pain, with swelling and redness of both ankle joints and the small joints of the right hand. There was swelling, though very little redness, of the left knee joint, together with evidence of free fluid in the joint. On the ventral surface of the index finger of the right hand was a dark reddened area, about 1 cm. in diameter, surrounding which was a border containing pus. It was considered embolic in origin. The whole finger was swollen and reddened. She was somewhat confused and spoke incoherently.

The pulse was regular, of good volume; no evidence of arterial thickening. Blood pressure was 135/65. The heart was not enlarged. A soft systolic murmur was present at the apex. The aortic second sound was clear. The lungs were clear. The spleen was not enlarged.

Pelvic examination revealed the urethra inflamed. A thin, purulent fluid exuded from Skene's tubules. The vaginal secretion was also purulent. The cervix showed marked bilateral lacerations and was eroded. The uterus was small, retroverted and fixed. There was slight thickening in both appendages, but no tenderness. There were no other palpable masses. The opinion was that it was a pelvic inflammation of a chronic nature.

Laboratory examination.—*Urinalysis.*—The urine had a specific gravity of 1028. Neither albumin nor sugar was present. Microscopic examination revealed scattered white blood cells and occasional granular casts.

Hæmatological examination (by Dr. J. Kaufmann).—Red blood cells 2,850,000; white blood cells 30,300; hæmoglobin 44 per cent; colour index 0.78. The red blood cells were pale; slight alteration in sizes and shapes, good rouleaux; no crenation. There was a marked hypochromic anæmia, with evidences of regeneration and degeneration; hyperleucocytosis and neutrophilia and deviation of polymorphonuclears towards immature forms, accelerated sedimentation velocity, lymphocytopenia and monocytosis. There was evidence of a marked infective process with marked myeloid hyperactivity and little reparative effort.

The blood Wassermann test was negative; gonococcal fixation, 4 plus.

Blood culture.—Gonococci were isolated. A smear from the urethra showed no Gram-negative diplococci.

The electrocardiogram showed no preponderance; regular rhythm; rate 120 per minute. Normal auriculo-ventricular conduction time. There was slight depression of the S-T interval in leads I and II.

Progress.—She continued with frequent chills, and on the fifth day in the hospital suffered a severe one and her temperature rose to 107°. Fever of the remittent type continued, with daily flights as high as 105°.

On September 14th, the infected index finger was incised and a considerable amount of pus evacuated. On September 22nd, large petechiæ appeared on the nail bed of the fingers and also on the conjunctiva. Examination of the heart now showed slight enlargement to the left. The systolic murmur at the apex had increased in intensity, and there was some roughen-

ing. Later in the day, petechiæ appeared on the tip of the tongue. On September 25th, the blood pressure was 98/40. A blood transfusion of 500 c.c. was given. The following day the left knee joint was aspirated and 9 c.c. of fluid withdrawn. Culture of this fluid revealed no growth. On September 28th, the patient complained of precordial pain. On examination, a friction rub was present. There was definite cyanosis of the fingers and œdema of the left leg. On September 29th, a second blood transfusion of 500 c.c. was given, and a third one on October 4th. On October 9th, microscopic blood appeared in the urine. She continued in this condition, at times irrational, and died on October 12th, forty days after onset of her illness. A diagnosis was made of gonococcal septicæmia, endocarditis and arthritis.

No autopsy was obtained.

Of interest in Case 1 is the presence of only slight cardiac hypertrophy (370 grm.) with a high degree of aortic insufficiency, attesting to the malignancy of the condition. In the presence of aortic insufficiency and without mitral stenosis, the mitral diastolic murmur heard at the apex was functional in origin and was a typical Austin Flint murmur. The ulceration extended through to the tricuspid valve on the right, involving the undefended space. That the bundle of His was involved was suggested from the electrocardiogram. Almost identical ulceration is present in a specimen in the McGill Medical Museum. This latter case was one of gonococcal endocarditis, clinically, but bacteriological studies were not available.

TREATMENT

Repeated small transfusions have been advocated, and in a case reported by Perry⁴ with positive blood culture, endocarditis and emboli, recovery ensued. Recovery has also been reported in other instances, but in the majority of cases treatment has been unsuccessful. Gonococcus vaccine, antigonococcal serum, intravenous silver preparations, mercurochrome, and intravenous metaphen have been suggested, without beneficial results and often with severe reactions.

REFERENCES

1. THAYER, W. S.: On the cardiac complications of gonorrhœa, *Bull. Johns Hopkins Hosp.*, 1922, 33: 361.
2. HOFFMAN, A. M. AND TAGOART, F. C.: Gonococcal endocarditis, *Ann. Int. Med.*, 1932, 5: 1397.
3. KARSNER, H. T.: Pathology of endocarditis; summary review, *J. Am. M. Ass.*, 1931, 96: 411.
4. PERRY, M. W.: Gonorrhœal endocarditis with recovery, *Am. J. M. Sc.*, 1930, 179: 599.

BENIGN EPITHELIAL INVASION*

BY WILLIAM BOYD, M.D., F.R.C.P.(LOND.),

Winnipeg

INVASION of the deeper tissues by surface epithelium is one of the most easily recognized and significant of the evidences of malignancy. But such invasion is not necessary for a diagnosis of malignancy, and, on the other hand, it in itself is not necessarily malignant.

The columnar cells lining a tubular gland or covering a glandular surface may proliferate and form new glandular structures, not only on the surface but also in the depths of the tissue, to such an extent that the new formation may be widely separated from the original surface, although connected with it by a narrow tract. Should the latter be tortuous, the original connection with the surface can no longer be recognized in a single section, and a mistaken diagnosis of carcinoma may be made. Such a condition may be called benign epithelial invasion. Stratified epithelium is also liable to this change, as may be seen at the edge of a chronic ulcer of the skin or in the lining of the ureter. The columnar epithelium lining the gall bladder, Fallopian tubes, uterus and stomach offers excellent examples of the process.

It is in the *gall bladder* that the condition is seen in its most striking form and is most readily studied. In a perfectly normal gall bladder, although the mucosa is thrown into folds, the epithelium does not dip down into the underlying fibromuscular layer. But in many gall bladders removed surgically there is proliferation of the epithelium and invasion of the wall to form crypts. This condition, to which the descriptive name of *cholecystitis glandularis proliferans* has been applied by King and MacCallum,² of Melbourne, is present in about 10 per cent of such gall bladders. There is often a thickening of the wall over the area of epithelial proliferation, the most common site of which is at the fundus of the organ. These formations have been recognized for nearly 100 years, for Rokitsansky noted mucosal out-pouchings in 1842, and Aschoff called attention to their importance in 1905, so that they

are sometimes spoken of as the Rokitsansky-Aschoff sinuses. They have also been called Luschka sinuses, but they must not be confused with the Luschka ducts ("true Luschka ducts" of Halpert¹), to which they bear no relation. The latter are aberrant bile ducts which occur on the peritoneal surface, generally on the hepatic surface of the gall bladder. These have no connection with the mucosal surface, as can be shown by means of serial sections. Many observers have sought to trace a connection between the out-pouchings and increased pressure within the gall bladder, with the idea that they are pressure effects in the nature of herniations of the mucosa through the muscularis, which is not a continuous structure in the gall bladder (Fig. 1). From my own observations it appears much more probable that the process is an epithelial proliferation, the result of chronic irritation. Active chronic inflammation or indications of former inflammation can always be found, but there is usually no evidence of biliary obstruction which might cause an increase of pressure within the gall bladder.

These formations have been interpreted by some observers as pre-cancerous in character. There is no good reason for this view. Slade,⁴ in a paper published in 1905, stated that early carcinoma of the gall bladder was present in 56 per cent of all cases of gall stones causing symptoms. Examination of his pictures shows that the condition was not early carcinoma but *cholecystitis glandularis proliferans*.

The neck which connects the deeper part of the pouch with the surface may be very narrow and is often tortuous (Fig. 2), so that the fundus of the pouch may appear to be completely isolated in the deeper tissues. It may become considerably dilated, giving a cystic appearance, and there may be a collection of these cysts quite close to the serosa, so that the thickened wall may appear to be honeycombed with ducts. The process may proceed to such an extent that a kind of diverticulum may be formed in which concretions are deposited, so that the observer may be misled into believing

* Read at meeting of the Surgeons' Club, Winnipeg, on November 16, 1933.

that a calculus has ulcerated through the wall. The epithelium of these new glands may differ considerably from that which lines the surface, being tall and columnar in type, with clear mucin-filled cytoplasm and nuclei situated at the base of the cell. These cells may be regarded as intestinal in type, but as the gall bladder is derived from the epithelium of the primitive alimentary canal, such a change need occasion no surprise. It is sometimes difficult to draw a sharp line between this epithelial proliferation and neoplasia. The proliferated epithelium may be piled up on the surface and form a papillomatous mass instead of invading the deeper tissues.

The benign epithelial invasion may in rare cases take on the character of a true infiltrative neoplasm, as in a case studied in my laboratory

and recently reported by Wigglesworth⁵ in this *Journal*. The patient, a woman 79 years of age, for ten years had a painless lump in the gall bladder region, which increased rapidly in size during the last six months till it formed a mass in the abdominal wall which extended from the costal margin to the crest of the ilium. At operation, the mass, which was continuous with the fundus of the gall bladder, was found to consist of a number of cysts. Microscopically, the wall of the gall bladder and the tumour with which it was continuous showed a picture of marked epithelial invasion with gland-formation (Fig. 3). Although it was not possible to be certain if the change in any given part was malignant, it is evident that the pathological process in the wall of the gall bladder and in

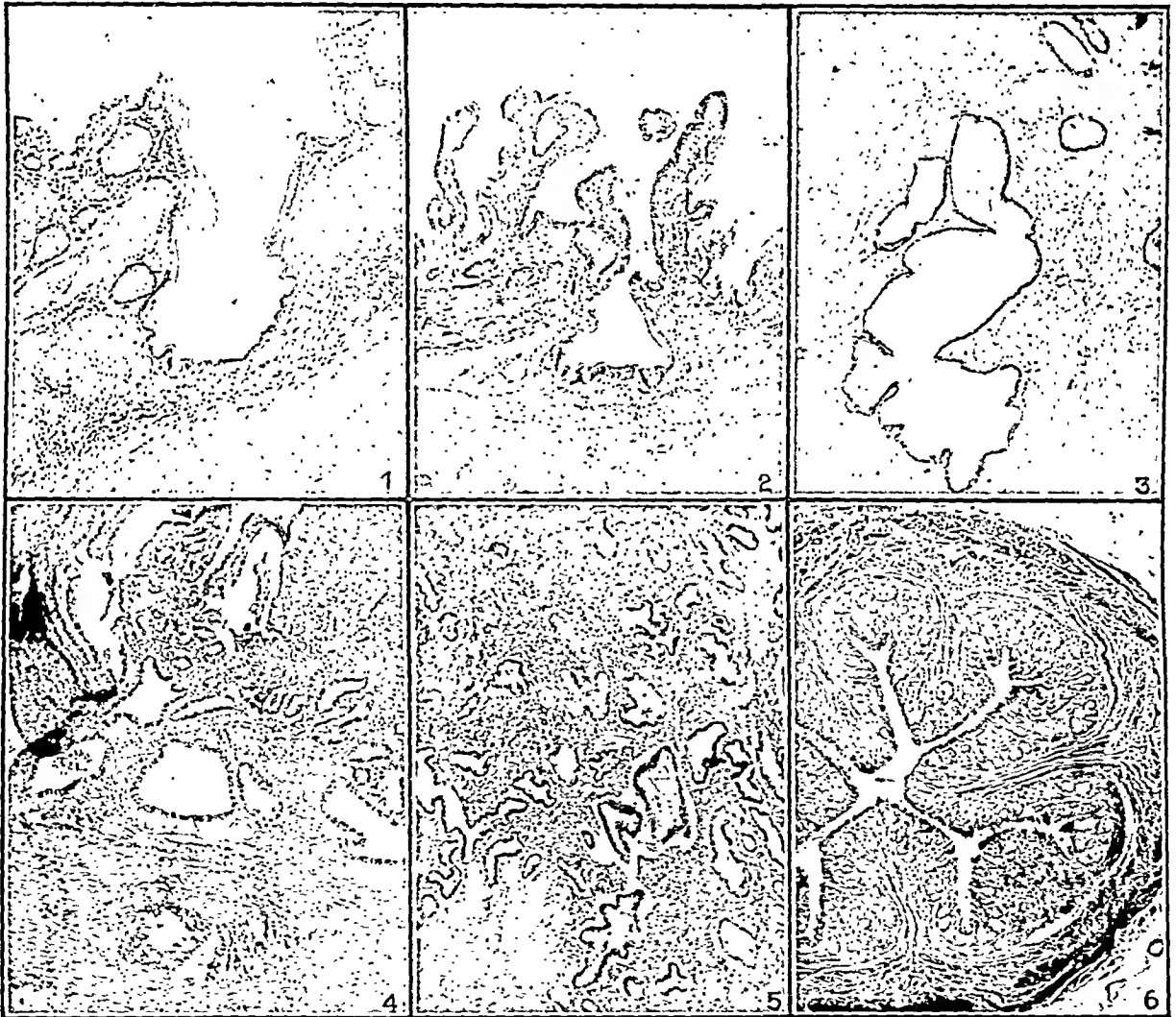


FIG. 1.—Out-pouching of mucosa through fibromuscular coat of the gall bladder, which might suggest the idea that it was caused by increased pressure. $\times 75$.

FIG. 2.—Showing characteristically narrow neck and penetration of fibromuscular coat. In other sections the appearance was that of a gland entirely separated from the surface. $\times 35$.

FIG. 3.—New epithelial formation in tissue between gall bladder and anterior abdominal wall. $\times 50$.

FIG. 4.—Benign epithelial invasion in Fallopian tube. $\times 50$.

FIG. 5.—Benign epithelial invasion in uterus. $\times 50$.

FIG. 6.—Benign epithelial invasion in the ureter. (From a specimen of Dr. Shields Warren).

the tumour of the abdominal wall was one and the same. The clinical course and the evidence of widespread invasion justify the assumption that we are observing the transition of a benign into a malignant process.

The process of benign epithelial invasion can be observed in other hollow muscular organs. The *Fallopian tube* offers one of the best examples. In chronic salpingitis a remarkable nodular thickening may sometimes be observed. This is caused by proliferation of the mucosal epithelium with a development of new glandular spaces in the depth of the wall, so that adenomatous masses may be formed deep down in the muscularis. The usual explanation given is that the epithelial cells of the mucosa, or perhaps portions of the entire mucosa, are squeezed by intratubal pressure into the substance of the muscular wall, where they produce true follicles, but there can be no doubt that there is an actual proliferation of epithelium and a formation of new glandular spaces. As this always appears to be associated with the presence of chronic inflammation, it is reasonable to suppose that the epithelial overgrowth is the result of long-continued irritation.

The *uterus* may also be the site of benign epithelial invasion. The line of division between endometrium and muscularis, which is never very sharp in this organ, is lost in endometrial hyperplasia, the condition which used to be known as glandular endometritis, and which appears to be due to over-production of œstrin and absence of corpus luteum activity. In such cases the glands of the endometrium may penetrate into the muscular wall for a considerable distance, owing to proliferation of the lining epithelium (Fig. 5). In adenomyoma of the uterus, which may be regarded as an exaggeration of this condition, the endometrium invades the muscularis, sometimes as far as the serous coat.

The *stomach* sometimes provides examples of the condition under discussion. In chronic gastritis or at the edge of a chronic ulcer there may be an atypical epithelial proliferation, with formation of new glands which penetrate between the bundles of the muscularis mucosæ and reach the submucosa, a state of affairs which may

be mistaken for carcinoma. Hurst and Stewart² found this epithelial heterotopia in 22 per cent of cases of chronic ulcer and in 40 per cent of cases where the ulcer had undergone complete cicatrization. In my own material these new formations have been much less striking than those which are found in the gall bladder, Fallopian tube and uterus.

It is difficult to say to what extent these examples may be multiplied. The epithelial downgrowth which occurs at the edge of an indolent ulcer of the skin and which may be so invasive as easily to be mistaken for malignancy is so familiar that it needs only to be mentioned. It is possible that the rupture which occasionally results from obliteration of the proximal end of the appendix and the formation of a mucocele, and which may be followed by the development of pseudomyxoma peritonei should be ascribed to epithelial invasion of the wall. In a section of the ureter which Dr. Shields Warren kindly sent me there was a most remarkable degree of benign epithelial invasion involving the entire circumference of the tube (Fig. 6).

The conception of benign epithelial invasion appears to be a useful one. Individual examples in such organs as the gall bladder, tube, uterus, stomach, and skin have long been recognized, but the mere act of grouping them together serves to call attention to a process which can be looked for in other organs. To the surgical pathologist a recognition of this possibility is of especial importance.

SUMMARY

Invasion of the deeper tissues by surface epithelium, whilst a hall mark of malignant disease, may also occur in benign conditions. Some of the more striking examples of this process have been collected under a common heading, but others can doubtless be added to the list.

REFERENCES

1. HALPERT, B.: Morphological studies on gall bladder, *Bull. Johns Hopkins Hosp.*, 1927, 41: 77.
2. HURST, A. F. AND STEWART, M. J.: Gastric and Duodenal Ulcer, Oxford Univ. Press, London, 1929, p. 123.
3. KING, E. S. J. AND MACCALLUM, P.: Cholecystitis glandularis proliferans (cystica), *Brit. J. Surg.*, 1931-32, 19: 310.
4. SLADE, G. R.: Gall-stones and cancer, *The Lancet*, 1905, 1: 1059.
5. WIGLESWORTH, F. W.: Rare tumours of the gall bladder, *Canad. M. Ass. J.*, 1933, 29: 410.

ONE THOUSAND AVERTIN ANÆSTHESIAS

BY WESLEY BOURNE, M.Sc., M.D., C.M., F.R.C.P.(C.) AND
P. E. O'SHAUGHNESSY, M.D., C.M.,

Montreal

ALTHOUGH the literature on avertin is extensive, the use of this anæsthetic is not yet universal. It is therefore relevant to analyze collected clinical data. One thousand administrations of avertin are accordingly reported.

Several important actions of avertin have been described: how it obtunds the nervous system^{1, 2} (this is the desired therapeutic effect); how respiration² is depressed; how the circulation³ is influenced; how the blood⁴ becomes concentrated and less alkaline; and how the functions of the liver^{4, 5, 6} and kidneys⁴ are somewhat impaired. The clinical and laboratory investigations on these actions have shown that avertin, in comparison with other anæsthetics, may be considered practically safe and

without contraindication, provided suitable doses are used. So true is this that it seems timely to predict an abiding usefulness for avertin. Its employment is on the increase.

Table I sets forth the various doses employed, as well as the numbers and percentages of the cases in this series. It will be seen that the doses range from 70 to 150 mg. per kilo. of body weight. In the earlier cases the standard dose from which we worked was 100 mg. per kilo. Later it was decided to raise this to 125 mg. per kilo. It is evident that in all of the cases nearly 34 per cent did not require any other general anæsthetic than the avertin given, whereas, when the doses were around 100 mg. per kilo. (90, 100 and 110), only 25 per cent

TABLE I.
AVERTIN: DOSES AND NUMBERS OF CASES

Doses: mg. per kg.	Total Number of Cases	Without other General Anæsthetics				With Nitrous Oxide			With Nitrous Oxide and Ether			With Ether			With Chloroform	
		Avertin alone	With Procaine	With Cocaine	With Percaine	Totals and Percentages	With Nitrous Oxide only	With Procaine	Totals and Percentages	With Nitrous Oxide and Ether	With Procaine	Totals and Percentages	With Ether only	With Procaine	Totals and Percentages	Percentages
70	1	1														
80	20	3	1				5	2		6	2		1			
90	12	3	1	1			3	1		3						
100	474	61 (12.9%)	43	11		134 in 534 = 25.1%	159 (33.5%)	20	194 in 534 = 36.3%	120 (25.3%)	11	151 in 534 = 28.3%	32 (6.7%)	2	36 in 534 = 6.7%	15
110	48	10	3	1			10	1		14	3		2		4	3.5%
115	17	11	1				2			3						
120	42	10	5		2	192 in 435 = 44.1%	13		168 in 435 = 38.6%	3	5	58 in 435 = 13.3%	3		11 in 435 = 2.5%	1
125	360	133 36.9%)	12	9			140 (38.9%)	8	45 12.5%	45 12.5%		8 (2.2%)	8		5	1.4%
135	16	9					4	1		2						
150	10	6					2			2						
	1000	247	66	22	2	(337)	338	33	(371)	198	21	(219)	46	2	(48)	25

could be similarly managed, as against 44 per cent when the doses were in the neighbourhood of 125 mg. per kilo. (115, 120, 125 and 135); that in all of the cases about 25 per cent had avertin only, whereas for the smaller standard dose the percentage is only 13 as against 37 in the event of the larger quantity; and that 37 per cent of all cases received nitrous oxide as the only other general anæsthetic, while the differences between the percentages of the cases of the smaller and larger doses are not so marked; also, that the remaining 29 per cent of the cases were given nitrous oxide and ether, ether alone, or chloroform as supplementary anæsthetics, the percentages in each instance being considerably greater when doses of avertin were smaller than when they were larger, as one would naturally expect.

When regional anæsthesia is combined with the use of avertin, there is no doubt that this practice lessens the necessity of additional general anæsthetics, afferent impulses being diminished. We regret that this procedure was not

adopted more often, although it has been highly commended elsewhere.⁷

Let us now consider those cases in which the smaller doses were given. One woman of ninety years of age received 70 mg. of avertin per kilo. of body weight. She was suffering from a fracture-dislocation of the hip. Anæsthesia was complete and she recovered without complications.

There were 20 cases in which 80 mg. per kilo. were given. The reasons for this small dose are not far to seek; they are set forth in Table II. The ages were from 27 to 76, most of them nearer the latter, which in itself was a factor determining the size of the dose, the belief being that elderly people should have relatively small quantities. Three subjects aged 27, 35 and 45 had lost weight, and this was the reason for the reduced doses; on all three laparotomies were performed; two required nitrous oxide only in addition, and one a little ether as well. Two were immoderately obese. On one of these colporrhaphy was done and no other anæsthetic

TABLE II.

CASES OF EIGHTY MILLIGRAMS PER KILOGRAM

No.	Age	Sex	Other Anæsthetics	Operation	Condition	Remarks
1	52	M.	Procaine N ₂ O and Et ₂ O	Cholecystectomy		No nausea. Appendix removed.
2	54	M.	N ₂ O and Et ₂ O	Cholecystectomy	Deeply jaundiced	No nausea
3	48	F.	N ₂ O and Et ₂ O	Cholecystectomy		Vomited bile few times. Appendix removed.
4	44	M.	N ₂ O and Et ₂ O	Cholecystectomy	Very obese	Vomited bile twice.
5	67	F.	N ₂ O and Et ₂ O	Cholecystostomy	Gall stones Fat necrosis	Died in 29 hours. (No. 6, Table IX)—pulmonary collapse.
6	66	F.	N ₂ O	Cholecystostomy	Acute pancreatitis	Vomited bile. Operation 39 days later (No. 8, Table III).
7	47	F.	N ₂ O and Et ₂ O	Hysterectomy	Anæmia	No nausea.
8	76	M.	N ₂ O and Et ₂ O	Anterior gastro-enterostomy	Carcinoma of stomach Very anæmic	Died 30 hours later. Gastric hæmorrhage (No. 7, Table IX).
9	35	M.	Procaine N ₂ O and Et ₂ O	Appendicectomy	Loss of weight	Vomited once.
10	76	M.	Ether	Proctoscopic examination		No nausea.
11	27	F.	N ₂ O	Bilateral salpingo-oophorectomy	Loss of weight	Slight nausea.
12	63	M.	Procaine N ₂ O	Appendicectomy		Appendix removed. No nausea.
13	72	F.	Procaine N ₂ O	Mammectomy	Carcinoma	No nausea.
14	72	F.	N ₂ O	Mammectomy	Carcinoma	No nausea.
15	73	F.	N ₂ O	Mammectomy	Carcinoma	No nausea.
16	45	M.	N ₂ O	Exploratory laparotomy	Loss of weight	Vomited once. Appendix removed.
17	60	F.	Procaine	Exploratory laparotomy		No nausea. Appendix removed.
18	50	F.	None	Anterior and posterior colporrhaphy	Very Obese	Vomited once.
19	34	F.	None	Implantation of radium—uterus		No nausea.
20	42	F.	None	Curettage	Anæmic	No nausea.

TABLE III.
CASES OF NINETY MILLIGRAMS PER KILOGRAM

No.	Age	Sex	Other Anæsthetics	Operation	Condition	Remarks
1	54	F.	N ₂ O and Et ₂ O	Cholecystectomy		Vomited once. Appendix removed.
2	44	F.	N ₂ O and Et ₂ O	Oophorectomy	Large cyst	No nausea.
3	8	M.	N ₂ O and Et ₂ O	Mastoidectomy		Vomited a few times.
4	57	F.	Procaine	Exploratory laparotomy	Hæmorrhage	Died 5 days later (No. 8, Table IX).
5	55	F.	N ₂ O	Hysterectomy	Cachectic carcinoma	No nausea.
6	60	F.	N ₂ O	Excision of lipoma		Slight nausea.
7	70	F.	N ₂ O	Mammectomy	Carcinoma	No nausea.
8	66	F.	Procaine	Exploratory laparotomy Drain—lesser cavity.	Pancreatitis	Died in 3 days; operation 39 days before. (No. 11, Table IX).
9	69	M.	Cocaine	Iridectomy	Acute glaucoma	No nausea.
10	51	F.	None	Reduction—Pott's fracture	Obese	No nausea.
11	68	F.	None	Closed reduction—fractured hip		No nausea.
12	88	F.	None	Closed reduction—fractured hip		No nausea.

was necessary; the other, a case of cholecystectomy, was given nitrous oxide with some ether. Of the three cases complicated with anæmia, one had a hysterectomy done; she required ether as well as nitrous oxide. The second, a case of carcinoma of the stomach, had to have some ether with the nitrous oxide. The third, in which the operation was curettage of the uterus, did not need supplemental anæsthesia. There were 6 gall-bladder cases, in 2 of which cholecystostomy was performed, and in 4, cholecystectomy. In all of these six, additional anæsthesia was necessary. The remaining cases are sufficiently explained in the Table. In all but 4 of the 20 cases, other general anæsthetics

had to be used, and it is evident that larger doses of avertin might have been given with safety.

Table III supplies the data concerning those occasions when 90 milligrams of avertin per kilo. of body weight were administered. The particulars of this group of cases are similar to those of Table II, with the exception that they seemed to warrant a larger dose.

Attention may now be turned to the other extreme in doses employed. On sixteen occasions, 135 mg. of avertin per kilo. of body weight were given (Table IV). The majority of the patients in this group were young, or very strong, or both. There was one case of

TABLE IV.
CASES OF ONE HUNDRED AND THIRTY-FIVE MILLIGRAMS PER KILOGRAM

No.	Age	Sex	Other Anæsthetics	Operation	Remarks
1	38	F.	None	Herniorrhaphy-inguinal	No nausea
2	4	M.	None	Suturing soft palate	No nausea
3	16	M.	None	Appendicectomy	No nausea
4	8	M.	None	Mastoidectomy	No nausea
5	12	M.	None	Reduction of dislocated elbow	No nausea
6	16	F.	None	Tonsillectomy	No nausea. Oxygen intra-tracheally
7	6	F.	None	Tonsillectomy	No nausea
8	19	M.	None	Open reduction—fractured olecranon	No nausea
9	17	M.	None	Plastic—lip. Extraction—2 teeth	No nausea. Old cleft-palate case
10	10	M.	N ₂ O	Appendicectomy	No nausea
11	33	F.	N ₂ O	Removal of polyp of cervix uteri	Moderate nausea
12	37	M.	N ₂ O	Excision of head of radius	No nausea
13	52	F.	N ₂ O	Removal of carcinoma of face	No nausea. Intratracheal.
14	52	M.	Procaine	Thyroidectomy	No nausea. Exophthalmic goitre
15	14	M.	N ₂ O and Et ₂ O	Herniorrhaphy and appendicectomy	Slight nausea
16	18	M.	N ₂ O and Et ₂ O	Tonsillectomy	No nausea. Pharyngeal.

TABLE V.
CASES OF ONE HUNDRED AND FIFTY MILLIGRAMS PER KILOGRAM

No.	Age	Sex	Other Anæsthetics	Operation	Remarks
1	34	F.	None	Secondary suturing—abdomen	Wt. 10 kg. Died 4 days after from pneumonia. Suffering pneumonia after operation for intussusception 10 days previously (No. 5, Tab. IX)
2	42	M.	None	Iridectomy, right	No nausea (Same case. Previously had had cocaine for nasal operation and showed marked systemic reaction.)
3	42	M.	None	Iridectomy, left	No nausea. Oxygen intratracheally
4	32	M.	None	Resection of nasal septum	No nausea. Awakening effects successfully demonstrated by 1.5 gr. ephedrine intravenously (Ref. 8).
5	16	M.	None	Appendicectomy	No nausea.
6	22	M.	None	Removal of plate-femur	Vomited several times. Acetone on breath, marked, Did not have phosphate rectal solution (Ref. 9).
7	6	F.	N ₂ O	Removal of plate-ulna	No nausea.
8	6	M.	N ₂ O	Appendicectomy	No nausea
9	13	M.	N ₂ O and Et ₂ O	Appendicectomy	No nausea
10	8	F.	N ₂ O and Et ₂ O	Tonsillectomy	No nausea. Pharyngeal.

TABLE VI.
AVERTIN WITHOUT OTHER GENERAL ANÆSTHETICS

Operation	No. of Cases	Milligrams per Kilogram										No. with Local	Remarks
		70	80	90	100	110	115	120	125	135	150		
Appendicectomy.....	58				16	2	1	4	33	1	1	25Pr.	Procaine infiltration
Cholecystectomy.....	2				2							2Pr.	1 spinal; 1 com. duet drain
Gastro-enterostomy.....	1				1							1Pr.	
Hysterectomy.....	10					2	2		6				2 appendicectomy
Exploratory laparotomy..	12		1		5	1	1		4			4Pr.	8 app.; 2 ooph.; 2 adhesions
Salpingo-oophorectomy...	5								5				4 appendicectomy
Miscellaneous abdominal..	3			1	1						1	2Pr.	Nos. 5 and 11, Table IX; other, replacing oocostomy
Herniorrhaphy.....	19				7		1	1	9	1		5Pr.	All inguinal. 2 bilateral,
Antrum.....	6				1			1	4			2Np.	3 spinal, 3 appendicectomy
Mastoid.....	2									1	1		4 radical, 2 intranasal,
Nasal septum.....	6												4 oxygen intratracheally
Tonsillectomy.....	13				4				7	2		1	1 bilateral
Cataract.....	4				2				2			6Ce.	3 turbinectomy
Enucleation, eye.....	3				1				2			4Ce.	10 oxygen intratracheally
Iridectomy.....	10			1	6				1		2	3Ce.	Cocaine instillation
Miscellaneous, eye.....	3				2				1			8Ce.	Cocaine instillation
Dental.....	26					3	4	6	11	2		2Ce.	2 of 150 mg. Same case without Ce—previous reaction
Dressings and skin grafts..	28				12	3			13				2 plastic; 1 removal of tear sac
Fractures and dislocations..	42	1		3	14		1	1	19	2	1	2Pr.	5 skin graftings
Gynæcol., minor.....	20		3		8	1			8			3Pr.	1 spinal
Mammary.....	12				6		2		4			2Pr.	2 sacral anæ. for "general repair"
Thyroidectomy.....	5				3				2			1Pr.	6 radical
Thoracotomy.....	6				6							5Pr.	3 toxic
Urological.....	10				4	2			4			6Pr.	Kidney 2, bladder 2,
Miscellaneous.....	31				14			4	13			3Pr.	cystostomy 2, hydrocele 2, orchidectomy and circumcision
												4Pr.	Decompression 2, œsophogscopy 2, and various minor operations
	337	1	4	5	115	14	12	17	154	9	6	90	14 intratracheal

Pr. = Procaine, Np = Nupercaine, Ce. = Cocaine.

toxic goitre in which it was necessary to give nitrous oxide in spite of the fact that procaine had been used. It will be noticed that in more than one-half of the cases avertin was the only anæsthetic used. Anæsthesia was complete in each of these instances.

The ten cases in which 150 mg. per kilo. were employed (Table V) were also young or youngish patients, similar to those of the preceding Table. In six instances no other anæsthetic was needed. In spite of the relatively large doses used in the cases set forth in Tables IV and V, inhalation anæsthetics had to be used fairly often, and on four occasions it was necessary to add small quantities of ether. It is pointed out, however, that when nitrous oxide is being administered after avertin has been given, oxygen may be used

more freely than otherwise, and that when it is necessary to add ether a very small quantity is sufficient. These two facts are all the more true for the larger doses in antithesis to the smaller doses of avertin. This is a strong argument in favour of the larger doses of avertin.

Several facts which have been posited in the foregoing Tables are confirmed in Tables VI, VII and VIII and, being evident, need no further comment. Attention is drawn to the variety of operations in each list. It is worthy of note that it was necessary to use other general anæsthetics for the so-called major operations more often than for others; this is especially true of operations on the upper abdomen. It is also worthy of note that the majority of these "major" cases were given smaller doses and

TABLE VII.

AVERTIN WITH NITROUS OXIDE AS THE ONLY OTHER GENERAL ANÆSTHETIC

Operation	No. of Cases	Milligrams per Kilogram									No. with Procaine	Remarks
		80	90	100	110	115	120	125	135	150		
Appendicectomy.....	97	1		42	2	1	7	42	1	1	15	6 intratracheal; 1 appendicectomy.
Cholecystectomy.....	10			9	1						4	
Cholecystostomy.....	2	1		1								1 of 80 mg. Died 39 days later after second operation (No. 11, Table IX).
Gastro-enterostomy.....	8			7				1				3 intratracheal; 1 part. gastrectomy; 1 anterior gastro-enterostomy; 1 with appendicectomy.
Hysterectomy.....	15		1	2	1		2	9				3 appendicectomy; 1 oophorectomy.
Exploratory laparotomy..	24	1	1	12	1						1	18 appendicectomy; 2 oophorectomy; 4 inoperable.
Salpingo-oophorectomy...	14	1		7				6				9 appendicectomy; 3 vent.-suspension.
Miscellaneous abdominal..	8			5			1	2				1 Cæs. sec.; 4 vent.-suspension and app.; 1 volvulus; 1 adhesion; 1 res. cæcum.
Herniorrhaphy.....	48			25	4	1	1	17			5	4 femoral; 9 bilateral inguinal; 2 ventral-postoperative.
Antrum.....	9			2				7				8 radical; 4 bilateral; 1 intranasal; 7 intratracheal.
Mastoid.....	3			1				2				1 intratracheal.
Nasal septum.....	1							1				29 intratracheal; 16 pharyngeal.
Tonsillectomy.....	45			10				35				1 intratracheal; turbinectomy.
Ethmoid.....	1							1				
Skin grafting.....	3			1				2				
Fractures and dislocations.	20			10	1			7	1	1	1	
Gynæcol. minor.....	16			13				2	1			
Mamnectomy.....	22	3	1	14	1		2	1			2	16 radical.
Thyroidectomy.....	2			1					1		2	Both very toxic.
Thoracotomy.....	4			3				1				
Urological.....	7			4				3			1	Kidney 5, bladder 1, urethrotomy 1 (No. 25, Table IX).
Miscellaneous.....	12		1	10					1		2	4 intratracheal—"Ca" face and neck, glands, lipomas, etc.
	371	7	4	179	11	2	13	148	5	2	33	51 intratracheal.

required additional anaesthesia: this is most strikingly true of cholecystectomies, cholecystostomies and exploratory laparotomies. These smaller doses were decided upon deliberately in accordance with earlier views—views which are still current. We have here another strong argument in favour of using larger doses of avertin than has been customary. In other words, one should endeavour to give so much avertin that ether will not be necessary, although a great deal of caution must be exercised in this direction. However, such an ideal has been partly attained, in that nitrous oxide alone was frequently sufficient as an anaesthetic additament and that when ether was used its quantity was relatively small.

The critical position into which one is brought by recommending larger doses as it accounts for, so it justifies, an explanation of what is meant by exercising caution concerning them. The amount of avertin per kilogram of body weight should be decided upon only after a careful evaluation of the patient by considering the following:— *Age*; the young stand avertin better than old people, just as the strong are more resistant than those who are weak. *Habits*; those who live active lives may have more avertin than those who are sedentary, just as those who indulge in alcohol or other drugs will be found to be more tolerant to it than those who do not. *Weight*; marked variations in either direction from standard values should indicate reduced doses.

TABLE VIII.

AVERTIN WITH NITROUS OXIDE AND ETHER, WITH ETHER ALONE, AND WITH CHLOROFORM ALONE

Operation	No. of Cases	Milligrams per Kilogram									No. with Procaine	Remarks
		80	90	100	110	115	120	135	135	150		
Appendicectomy.....	71	1	1	43		2	7	17		1	6	3 CHCl ₃ , 14 Et ₂ O alone.
Cholecystectomy.....	28	4	1	18	2		1	2			3	16 intratracheal; 9 appendicectomy.
Cholecystostomy.....	6	1		5								3 intratracheal; 1 appendicectomy.
Gastro-enterostomy.....	10	1		5	1		2	1			1	3 intratracheal; 1 gastrostomy; 3 appendicectomy.
Hysterectomy.....	13	1		7	2			3				1 CHCl ₃ , 3 Et ₂ O alone.
Exploratory laparotomy..	31			22	4	1		4			2	6 Et ₂ O alone; 3 intratracheal. (See Legend No. 1, below.)
Salpingo-oophorectomy...	8		1	3				4				2 Et ₂ O alone; 3 appendicectomy.
Miscellaneous abdominal..	6			6								2 gastrectomy; 2 perf. duoden. ulcer; 2 abdominal abscess.
Herniorrhaphy.....	34			17	7			9	1		2	1 CHCl ₃ , 6 Et ₂ O alone; 5 ventral, 3 bilateral, 3 appendicectomy.
Antrum.....	6							6				6 intratracheal, all radical; 2 bilateral and 1 tonsillectomy.
Mastoid.....	2		1	1								2 Et ₂ O alone.
Nasal septum.....	3			3								1 CHCl ₃ ; 2 intratracheal.
Tonsillectomy.....	13			3				8	1	1		11 intratracheal; 2 pharyngeal.
Eye.....	5			2			2	1				5 CHCl ₃ ; 3 iridectomy; 2 plastic.
Skin grafting.....	3			3								2 ether alone.
Fractures and dislocations.	20			13	6			1			3	4 chloroform; 4 ether alone.
Gynaecol. minor.....	6			5				1				1 CHCl ₃ , 2 Et ₂ O alone.
Mammectomy.....	7			5	1			1				5 radical; 2 ether alone.
Thoracotomy.....	1			1							1	1 CHCl ₃ .
Urological.....	5			5							2	2 Et ₂ O; 1 circumcision; 1 orchidectomy; 2 lithotripsy; 1 nephrectomy.
Miscellaneous.....	14	1		13							3	3 ether alone; 2 intratracheal; 8 CHCl ₃ . (See Legend No. 2 below.)
	292	9	3	180	23	3	12	58	2	2	23	25 with chloroform; 45 with ether alone; 46 intratracheal.

Legend No. 1—21 appendicectomies, 2 cases of volvulus, 3 adhesions, 1 inoperable, 1 hæmorrhagic pancreatitis, 1 partial gastrectomy, 1 pancreatic cyst and 1 biopsy of the omentum.

Legend No. 2—3 rectal, 2 lipomas, 1 subacromial bursa, 2 carcinoma of face, 1 cyst of neck, 1 foreign body of hand, etc.

Physical condition; cachectic, anæmic and wasted individuals, as a rule, may not have large doses of avertin, an exception being that those who suffer from exophthalmic goitre stand large doses of this drug very well. In short, one should find out as much as possible about the individual patient before deciding

on the amount of avertin to be given, and when the amount has been decided upon, it should then be instilled into the rectum very slowly (7 and 8); about ten minutes ought to be taken.

One hundred and nine operations were performed in the field of ear, nose and throat

TABLE IX.
DEATHS AFTER ONE THOUSAND AVERTIN ANÆSTHESIAS

No.	Cause	Operation	Time after Operation	Sex	Age	Mg. per Kg.	Other Anæsthetics	Remarks
1	(2nd day) Pneumonia...	Cholecystectomy	77 hours	F.	68	100	N ₂ O and Et ₂ O	No autopsy. Mod. circulatory depression.
2	(next day) Pneumonia...	Cholecystectomy	48 hours	F.	45	100	Procaine N ₂ O and Et ₂ O	Autopsy. Myocarditis and miliary tuberculosis.
3	(16th day) Pneumonia...	Anterior gastro-enterostomy	18 days	M.	68	100	N ₂ O	Autopsy. Advanced carcinoma. Mod. circulatory depression.
4	(3rd day) Pneumonia...	Gastrotomy, Gastro-enterostomy	7 days	F.	13	110	Procaine N ₂ O and Et ₂ O	Splenectomy 4 years ago. Operation now for hæmorrhage from duodenal ulcer.
5	Pneumonia ...	Secondary suturing	4 days	F.	¾	150	None	Operation 10 days before for intussusception (Table VI, No. 7 and Table V, No. 1) Autopsy.
6	Pulmonary collapse....	Cholecystostomy	29 hours	F.	67	80	N ₂ O and Et ₂ O	Gall stones and fat necrosis (Table II, No. 5).
7	Hæmorrhage...	Anterior gastro-enterostomy	30 hours	M.	76	80	N ₂ O and Et ₂ O	Carcinoma. Very anæmic. (Table II, No. 8.)
8	Hæmorrhage...	Exploratory laparotomy	5 days	F.	57	90	Procaine N ₂ O	Autopsy. Syphilitic. Hæmorrhage from eroded gastric artery (Table III, No. 4).
9	Hæmorrhage...	Partial gastrectomy	21 days	M.	46	100	N ₂ O and Et ₂ O	Autopsy. Marked circulatory depression.
10	Hæmorrhage...	Partial gastrectomy	4 hours	F.	66	100	N ₂ O and Et ₂ O	Autopsy. Carcinoma of stomach.
11	Pancreatitis...	Drainage of lesser cavity	72 hours	F.	66	90	Procaine	Autopsy. Cholecystostomy 39 days before (Table VI, No. 7 and Table III, No. 8).
12	Pancreatitis...	Exploratory laparotomy	72 hours	M.	30	125	Ether	Autopsy. Hæmorrhage in upper abdomen.
13	Hæmorrhage...	Cholecystectomy	5 days	M.	61	100	N ₂ O and Et ₂ O	Internal hæmorrhage.
14	Obstruction...	Exploratory laparotomy	48 hours	M.	33	125	N ₂ O and Et ₂ O	Autopsy. Carcinoma of liver. Volvulus.
15	Obstruction...	Cœcostomy	8 hours	F.	53	110	N ₂ O and Et ₂ O	Autopsy. Miliary tuberculosis. Volvulus.
16	Obstruction...	Colostomy	76 hours	F.	32	100	N ₂ O and Et ₂ O	Autopsy. Carcinoma of sigmoid; adhesions, peritonitis and myocarditis.
17	Obstruction...	Salpingo-ophorectomy	48 hours	F.	29	125	N ₂ O	Autopsy. Adhesions and peritonitis.
18	Peritonitis....	Cholecystectomy	19 days	F.	65	100	N ₂ O and Et ₂ O	Autopsy. Subdiaphragmatic abscess.
19	Peritonitis....	Appendicectomy	11 hours	F.	38	115	N ₂ O and Et ₂ O	Gangrenous appendix; quantities of pus; very toxic beforehand.
20	Peritonitis....	Appendicectomy	70 hours	M.	51	120	N ₂ O and Et ₂ O	Acute perforated appendix. Nephritis.
21	Carcinoma....	Exploratory laparotomy	19 days	M.	52	100	N ₂ O and Et ₂ O	Autopsy. Very advanced carcinoma of liver and tuberculosis of lungs.
22	Carcinoma....	Mamnectomy	3 hours	F.	63	100	Procaine N ₂ O	Very advanced carcinoma. Restless after, but did not regain consciousness.
23	Paget's disease	Partial removal of tumour	26 hours	F.	55	100	Procaine	Tumour, skull. Marked circulatory depression.
24	Fractured skull	Suturing hands and spinal puncture	14 hours	M.	50	100	None	Unconscious before and after.
25	Uræmia.....	Urethrotomy	6 days	M.	47	100	N ₂ O	Carcinoma of penis.

surgery, in 27 of which avertin was the only anæsthetic employed, in 58 nitrous oxide was used with the avertin, and in 21 some ether had to be added to the nitrous oxide. On 71 occasions intratracheal insufflation was performed. Several times this was done even when avertin was the only anæsthetic employed, and then oxygen was blown into the trachea. Often when nitrous oxide was insufflated we might have done without it. The advantages of insufflation are now no longer in question. Although these series of operations do not contain many on the eye, yet, as has been affirmed elsewhere,¹⁶ our ophthalmologist, Dr. A. Bramley Moore, expresses great satisfaction with avertin anæsthesia.

These three Tables (VI, VII and VIII) require no further explanation.

In this series of 1,000 cases, the occurrence of nausea and vomiting has been investigated in all. Even when these manifestations were very slight they were counted. We are fully aware of the variety of factors which influence their occurrence and are mindful of the difficulty of securing absolutely accurate notes concerning them, yet it has seemed worth while to record the results.

		Per-	
Nausea and vomiting after avertin		centage	
alone	25 in 337	=	7.4
with N ₂ O	67 in 371	=	18.0
with N ₂ O + Et ₂ O or			
Et ₂ O alone	99 in 267	=	37.0
with CHCl ₃	3 in 25	=	12.0
	194 in 1,000	=	19.4

We are quite sure that avertin by itself causes no nausea, just as we believe that it is the best anæsthetic extant for inducing peaceful sleep.

Before going on to the most sombre proposition of this work, that of considering the deaths, a short digression may be allowed. It is well known that the administration of avertin is followed by a long period of unconsciousness. It is granted that this feature has many advantages, among which one has recently come to our attention, namely, that a patient may be brought back to the operating room several times without his knowledge, for such incidents as post-operative hæmorrhage or the resetting of fractures.

Of these 1,000 persons to whom avertin was given, 25 subsequently died. A perusal of Table IX will persuade one that avertin

can hardly be blamed for any of these deaths. It has been shown that avertin causes death primarily by depressing the respiratory centre.¹⁷ It has also been shown that respiratory depression is considerably lessened when avertin is administered slowly.¹⁸ In none of the 25 patients who died was respiration unusually depressed, so much so that it was not necessary to use respiratory stimulants. It will be seen that 21 of them had to have other general anæsthetics, and that 16 of these required ether, which points to the fact that the depression of avertin itself was not severe. Who can say, of the cases with pulmonary complications, how much influence there was attributable to avertin? We believe that there was very little, if any. There were 6 of them; 5 occurred in patients in whom the operation was in the upper abdomen, and the other (No. 5) was an infant who had pneumonia at the time (Table V, No. 1).

Circulatory depression is noted at four places in Table IX, and means in each instance that there was a fall in blood pressure concurrent with a rise in pulse rate, premonitory of shock. In each, ephedrine was given, and in each the circulation was evidently improved during the operation and for some time after. Eichholtz¹ found that the heart and blood pressure remained practically uninfluenced by a dose of avertin sufficient to produce ordinary anæsthesia, and Raginsky and one of us⁵ have demonstrated the restorative action of ephedrine in avertin anæsthesia. From the point of view of the lethal effects of avertin, the cases of hæmorrhage give us little concern, for the reason that they bled and avertin has nothing to do with this occurrence. Those who died from pancreatitis, intestinal obstruction or peritonitis were all very ill, and, we are convinced, would have died under any circumstances. The twenty-fifth case recovered completely from the effects of the anæsthetics, but death occurred six days later from uræmia brought on by obstruction in the urethra from carcinomatous growth. While it is true that the twenty-second case resulted in death three hours after operation, the patient nevertheless showed a tendency to recover from the effects of avertin, as evidenced by restlessness. At any rate, she was in a very cachectic condition on account of carcinoma of the breast, which was so advanced that it was fungating and

necrotic, the operation being performed for cosmetic and sanitary purposes.

It should be added that all of these 25 patients received oxygen and carbon dioxide post-operatively, as did the majority of the others of the entire series.

A careful and we think impartial analysis of these 25 cases convinced us, at any rate, that avertin could be exonerated from being more than a coincidence in these quite unavoidable mortalities.

We are pleased to note that others^{11, 12, 13} who have used avertin extensively give equally eulogistic reports. We ourselves confess to quite definite enthusiasm.

SUMMARY

1. Avertin is a relatively safe anæsthetic and should be used more extensively.

2. Local anæsthetics should be used with avertin more frequently.

3. When nitrous oxide is being given together with avertin, oxygen may be administered

more freely than when nitrous oxide is being given alone.

4. Avertin does not cause nausea.

5. Doses of avertin should be greater than is customary.

6. Avertin should be administered slowly.

REFERENCES

1. EICHHOLTZ, F.: Über rektale narkose mit Avertin, *Deutsche med. Wchnschr.*, 1927, 53: 710.
2. ANSCHÜTZ, W., SPECHT, K. AND TIEMANN, FR.: Die Avertin-narkose in der Chirurgie, Springer, Berlin, 1930.
3. RAGINSKY, B. B., BOURNE, W. AND BRUGER, M.: Effect of avertin upon circulation, *J. Pharmacol. and Exper. Therap.*, 1931, 43: 219.
4. BRUGER, M., BOURNE, W. AND DREYER, N. B.: Effects of avertin on liver function, *Am. J. Surg.*, 1930, 9: 82.
5. BOURNE, W. AND RAGINSKY, B. B.: Effect of avertin upon normal and impaired liver, *Am. J. Surg.*, 1931, 14: 653.
6. MCKIM, L. H. AND BOURNE, W.: Use of avertin in multiple dressings; effects on the liver, *Canad. M. Ass. J.*, 1933, 28: 149.
7. GURD, F. B. AND BOURNE, W.: Avertin in surgical anaesthesia, *Canad. M. Ass. J.*, 1931, 25: 587.
8. RAGINSKY, B. B. AND BOURNE, W.: Action of ephedrine in avertin anaesthesia, *J. Pharmacol. & Exp. Therap.*, 1931, 43: 209.
9. BOURNE, W.: Attempt to alleviate acidosis of anaesthesia, *Proc. Roy. Soc. Med.*, 1926, 19: 49.
10. DAVIS, F. A.: Tribromethanol (avertin) as anæsthetic in eye surgery, *Am. J. Ophth.*, 1932, 15: 208.
11. SHIPWAY, SIR FRANCIS E., London, Eng. Personal communication.
12. WIDENHORN, HANS, Freiburg-im-Breisgau. Personal communication.
13. SCHULTE, A.: Über fünfjährige Erfahrungen mit rektaler Avertin-narkose, *Zentralbl. f. Gynäk.*, 1933, 57: 2565.

CORRECTIVE MEASURES FOR PROGRESSIVE DEAFNESS*

By G. BERRY, M.D.,

Worcester, Mass.

DEAFNESS is a fairly universal ill. Perhaps 3 to 5 per cent of our children are hard of hearing: surely one out of ten of all adults suffers from this affliction. There are all grades, from a slight impairment to total deafness, from a handicap that spares until old age dims the lights, to the fettering oblivion which smothers the deaf child before speech can be acquired or education begun. In order to understand the better, at least, part of this broad and serious problem we can with advantage focus our attention. I am therefore inviting your scrutiny of the so-prevalent phase called progressive deafness.

PROGRESSIVE DEAFNESS

Progressive deafness in its typical form begins in adolescence. There is some dispute as to whether the incipient stage is not really in childhood. Many of us are contending that here is the onset and here the most hopeful point of

attack. The encroachment is gradual and therefore not realized until fairly well advanced. A 15 or even a 25 per cent loss may be reached before parents or friends are aware of the malady. As for the patient I may perhaps picture his own conception as that of remaining stationary while gradually the world of sound seems to be receding. Some of my hearers may have shared in this phenomenon. For such, the ear remains where it was, but certain sounds move farther away, the birds sing less enthusiastically, thunder does not intrude as often, people mumble their words more. Suppurative processes may superimpose and toxic complications intervene, but, excepting the accelerations they occasion, there continues the slowly marching insidious advance of the obstructive or catarrhal condition we are considering. With medical skill to help we may be able to hold things in check, and even make some gain, between the ages of twenty-five and fifty. Then senile changes begin and another steady decline may commence. In the earlier years, it is the

* Read at the Fifty-fourth Annual Meeting of Ontario Medical Association, Toronto, May 30, 1934.

low tones that are more affected. With toxic or senile changes the high tones slide off more. Not a cheering picture!

CORRECTIVE MEASURES

With this initial consideration of progressive deafness we turn to the corrective measures invited by our title. If any of you were seeking such corrective measures you would naturally and properly turn to an otologist. He is a trained expert, devoting his life seriously and continuously to understanding pathological processes involving the ear.—There is the surgical approach. The tonsils and adenoids may be causing recurring colds or Eustachian tube congestions; bad teeth may furnish their toxic handieap; a suppurative process in a sinus or in the middle ear may be adding its quota; a badly deviated septum may occasion faulty breathing. All these are amenable to skilled effort.—There is the medical approach. An allergic nasal mucous membrane may be contributing trouble; erroneous ingestion and faulty elimination may add to the burden; hygienic habits, supposed to be normal, may be quite at fault. He who would conscientiously serve such a patient must leave no stone unturned which will look toward finding and correcting any contributing factor.—But the average otologist is highly skilled. To the above suggestion that he look with more care and exert greater acumen, he may reply as the nobleman did to the Master: "All this have I done". If a temporary attack supervenes—an acute rhinitis, a congested tube, a retracted drum—our otologist will institute a series of treatments looking toward rectifying these errors. Success is attained and the temporary loss is restored. But further treatments may make the nose too roomy, or the tube too patent, or the drum membrane stretched and over-inflated. Before these can happen the usual conscientious doctor has said he has done his best and bids the patient goodbye.

It is just at this point in the wanderings of our discouraged patient and in the strivings of our conscientious otologist that the second phase of this discussion enters. What shall we do now? Is there no hope? These patients are scarcely ready to chant *morituri salutamus*. They are not yet prepared for their Nirvana. Their otologist has striven valiantly. Also, he has possibly received a considerable fee. He has tried every trick in the bag, employed every skill

at his command. But has he given of his wisdom and imparted from his store of experience that help which the patient so needs? There is further help available, not ideal, not what the patient expects or desires, but reasonably adequate, and a great boon to him who seeks and accepts it. These helps are in the nature of adjustments, not cures, but they are therapeutic in nature, just as much as is a druggist's prescription: and the otologist is the best initial agency for their application. I refer to the three important corrective helps of lip-reading, mechanical hearing aids, and psychological rehabilitation. Permit me to dwell for a moment on each of these important crutches for our limping patient.

LIP-READING

First there is lip-reading. Here the sense of sight tries to do double duty, and through an entirely different nerve approach, and by way of other brain paths, the speaker's idea is grasped. This means laboured and patient training. Brain centres do not accept and react unconsciously and automatically to new stimuli overnight. Long and tedious is the road our lip-reader must travel, but success awaits the winner and he who at last overcomes deserves and receives the crown. I wish you could attend with me the lip-reading tournament that will take place next month in Washington. The best will have come from the United States and Canada. You would marvel, and wonder how they can interpret sentence after sentence without error. But incredible as can be their accomplishment it is but a crutch, very worth while having, but not ideal. For instance, the lip-reader needs a good light on the speaker's face, lips that are not covered by a mustache, that move distinctly, and are neither over- nor under-active.

The fastest progress in lip-reading I ever saw demonstrated was in our Army School at Cape May, New Jersey. This responsibility gave me my first contact with this absorbing work; 108 war-deafened boys passed through our hands. They were sent to us for almost this sole purpose. Each had the undivided help of a skilled teacher for two and even three periods a day. They were saturated with lip-reading, and six to eight weeks of this intensive training saw many develop into expert lip-readers. It was interesting to note that a high mental development did not

necessarily help. Rather did the writer find an analytical habit of approach a distinct handicap when he took a few lessons. One ignorant Southern negro developed into a fine lip-reader, outstripping an officer and university graduate. The child usually learns more easily than the adult.—I wish there were time to dwell on this hard-of-hearing child problem, and to speak of the rapid growth of testing the hearing in the public schools; of the establishment of diagnostic clinics where the children can be examined, medical procedures advised, and corrective measures outlined; of the formation of lip-reading classes where the children attend two or three times a week and with this help can keep right on in their regular classes and in their normal environment, with a tremendous saving to the city treasury, and with renewed hope and comfort to the handicapped and discouraged youngsters.

THE EAR-PHONE

The second medium for help is the mechanical hearing aid. These are of varying types. Most are modifications of two forms — the trumpet, and the telephone, which we may call the ear-phone. The trumpet type may be used as a speaking-tube, taking the volume of sound direct to the ear, or it may be used as the reverse-end of a megaphone which carries the sound waves down the funnel to concentrate them at the ear piece. The major advantages of this type are that they are relatively cheap, they do not get out of order, and they do not distort the sound reaching the ear; the major disadvantages are the limitations and awkwardness inherent in their use, the extreme size needed to get any considerable magnification.

The ear-phone is more flexible. A very good rough test as to its adaptability to a given case is through the patient's own use of the telephone. A catarrhal patient may be quite deaf but be able to hear pretty well over the telephone. An ear-phone should help him. A patient with nerve deafness is likely to find adventitious sounds confusing. To him a conversation over the telephone seems jumbled. An ear-phone will be of questionable use to him.

Those who can use an ear-phone expect much of it. They ask it to pick up a clear voice from say fifty feet away, and to magnify it at the ear-piece so that it is loud and distinct enough to be understood by an ear that has lost perhaps

40 per cent of its acuity. Or, expressed roughly, they expect to hear conversation four times as far away as they can without the help of the instrument. The modern ear-phone can do that, thanks to the American Federation of Organizations for the Hard of Hearing and its members who have stimulated, to the altruistic geniuses who have invented, and to the artist workmen who have manufactured. But it has not yet reached perfection. It is too expensive. The actual making probably costs one-third to one-quarter of the final price. Some one must pay for the research work, for the advertising, for the many free trials, for the widely distributed agencies. It is delicate and gets out of order; the batteries become exhausted; the wire connections break. As a result, many a user has found his artificial hearing suddenly gone, and how he then wishes he could have the God-made variety back again! The instrument seems crotchety and fickle at times. In the hushed quiet of a beautiful concert it may cross-circuit and sing its own song, in shameful rivalry to the music of a Rosa Ponselle or a Fritz Kreisler. It distorts the sound somewhat and magnifies adventitious sounds as well, even to drowning out the sound we are listening to. The rattle of a program at a concert, or hand-clapping by one's neighbour, or the clatter of a dinner partner's fork on her plate, are deafening noises, for they are so near.—A word of explanation may help here. All of us have a threshold of audibility. This is at the silent end of our hearing capacity. At the loud end is the so-called "sensation point". At this latter point sound becomes so intense as to be felt; yes, it hurts. Varying hearing capacities have varying thresholds; but for all of us, whether hard of hearing or normal, our sensation points are about the same. When we realize this, we can understand that for the very hard of hearing the two extremes, the threshold of audibility on one end and the sensation point, on the other, are very near together. The margin is small. The ear-phone must keep within range. With magnification below that narrow range, I do not hear; with magnification above that range, the noise is unbearable. The manufacturer's task is not easy.

We have expected the same type of instrument to serve every need. A few firms are now realizing that the ear-phone should be adjusted to the individual, not the individual to the ear

phone. One effort was when the Sonotone Company developed its bone conduction ear-piece. They claim for it a clearer and less intense tone. This gave them two types of receivers; by air, and by bone. Now the Bell Telephone Laboratories have produced two distinct transmitters, one designed to help catarrhal or conduction deafness where the low notes are weakest, and the second to help the nerve or perception type where the upper tones are deficient. These are long steps in the right direction. As the manufacturer progresses we can conceive of three or even five different grades. Then, all the hypacusie patient will need will be a careful audiogram curve of his impairment, and the manufacturer will be able to send him the proper instrument. This happy day may be still distant, but those of us who have watched the evolution of the ear-phone find it rapidly drawing nearer. Now, with instruments so much better than ten or even five years ago, the inhibitions against wearing them are breaking down. Those who can manage without will find that they can do so much better with. Most of us could manage without eyeglasses, but how many do? General use and quantity production will bring the price within the reach of nearly all.

It has been suggested that the use of an ear-phone will rob the individual of the need of trying to hear and atrophy will result. This idea has been quite general, but has been proved untenable. Quite the contrary is the case. The hard-of-hearing person cannot hear as easily with an ear-phone as the normal can without one, but he does hear something. He strives yet harder to hear. If he takes off the ear-phone, he may hear nothing, and there is no longer the incentive for trying. Atrophy of disuse comes faster without than with this help.

Possibly a few concrete words of advice may help the potential purchaser of an ear-phone. Until standardization has advanced further the trial method must be followed. Try different makes. Some will best suit one, others another. Always take the instrument home and try it under normal life surroundings before buying it. Good companies understand this need. A nominal rental is properly charged which can be credited against the purchase price. The more expensive instruments are the more satisfactory in the long run. Try to secure one that

can use a standard dry-cell battery. It is cheaper, and can be secured readily wherever one travels. Good servicing is important. An ear-phone becomes as essential to one's happiness as does an automobile. It can ill be spared for shipping to a distant repair centre.

The above weak points have been explained because not to be forewarned of them finds the patient discouraged at the start. An ear-phone must be used like a garment before the strangeness can wear off. With this familiarity conversation that has been difficult becomes relatively easy. If the hearing is not too impaired, one can now resume many of the activities which were being curtailed. Not only is it easier for our friends to talk with us, but the world of sound returns again to a degree. The exquisite harmonies of a symphony orchestra, the laughter of children at play, the treasured voice of a loved one, are sorely missed if once taken away.

REHABILITATION

Our third corrective measure is the psychological. This was my chief theme before the Otological Section of the American Medical meeting last summer in Chicago. I can refer to it but briefly. As human beings we crave perfection. We are ashamed of an infirmity; this is axiomatic. The short woman wears high heels, the cripple tries to run. The hard of hearing deceive themselves and their friends as long as they can. This is natural. If it comes early in life the tragedy is there, but youth is resilient, especially if an understanding friend or a sympathetic parent takes his hand and leads the way. If the onset is in middle life, the man has his business contacts that make allowance for this disadvantage. He knows he is needed in the life around him; he finds daily opportunities for self-expression; he would like it to be different, but he carries on and is content. It is the woman who has the harder time. Her contacts are more superficial and more easily severed. She cannot be the jolly conversationalist that she used to be; it is harder to hold up her end in bridge, in club activities, or at the church; she finds it more difficult to entertain at her home; her husband seems to find it ever easier of an evening to enjoy his pipe and his book by himself. Slowly and cruelly her world contracts about her till, shut out of one thing and then another, she shrinks from every contact. First worry, then fear, finally despair, exact their toll.

Supersensitive, irritable, emotionally unbalanced, one trouble after another develops and there seems no relief.

One other type comes all too frequently. This is the deafness of advanced years. Here we have more impairment in the upper tones; here the ear-phone has not answered the need. The younger patient has a way out if he or she will take it, but the man of 65 travels untried trails with difficulty. Perhaps he is a man of affairs, his counsel has been sought in groups where weighty matters are discussed. He expected to serve as long as strength within him lay, is still rugged and strong, conscious of experiences and capacities for great and useful service; and yet, the world no longer has need of him. He is put away on the shelf long ere his time to stop has come. What then can he do? He suffers the "labour and sorrow" of the psalmist's four score years, and he is not "soon gone" and there is no "flying away". Fortunate is he if his rich life has built within him resources and springs which will continue to flow. Hobbies can delight; his pen can be just as vivid and entrancing; his family can the better know his profound philosophies; and, above all, she who has stood by him in sunshine can now illumine his shadow, and, each serving as a complement of the other, they can live gaily and serenely together through the ebbing years.

But it is the rehabilitation of those who lose their hearing while in their prime that I would emphasize. They are still young enough to be adaptable, to find their way out. For them especially are designed these corrective measures. The patient is beyond the help of tonics; surgical skill may offer no relief; but curative measures are available and the wise and broad-visioned doctor will seek them as eagerly and employ them as deftly as he will a drug or a scalpel. The art of lip-reading can be tackled and mastered by such as these. For them, an honest review of the situation, a frank confession of the infirmity, and a sensible conclusion to use the inventive genius of the ear-phone manufacturers, corrects in a large measure the handicap and rejoices the neighbour or partner or relative in being able to again have easy speech with his friend. Re-adjustments are hard, but they can be made. It is within one's own power, and happiness here, as elsewhere, is determined by one's own view-point.

One of the most effective agencies for the re-

habilitation I describe has been the American Federation of Organizations for the Hard of Hearing. I believe there are eight leagues in Canada, one here in Toronto, and other groups are forming, to join later the central Federation. There are over 130 of these leagues for the hard of hearing in America now, with memberships ranging from 25, to as high as 800. Here are gathered those who are determined to surmount their handicap. Here, both example and precept stimulate the newcomer out of his discouragement and into a determination to make the most of the many talents a bountiful Providence has blessed him with.

COMPENSATIONS

May I turn the page and dwell for a moment on the brighter side of the problem we are considering? Nature seems to delight in compensation. The wind-blown tree grows tougher bark and digs in more firmly with its roots. The northern animal grows a thicker fur. The bear's sight is poor but his very keen sense of smell early warns him of lurking danger. A Helen Keller's sense of touch is past our comprehension. The expert lip-reader can see and interpret facial movements that come and go ere we are aware of them. The pages of history teem with glorious accomplishments by the handicapped. Lord Byron, the cripple, swam the Hellespont; the divine Pavlova had back trouble; the orator Demosthenes controlled a speech defect by placing a pebble under his tongue; the blind Milton saw visions, and the deaf Beethoven heard symphonies that will continue to satisfy a hungry world down through the ages. Most of us have a burden to carry, as had Christian in Pilgrim's Progress. Do not then be sorry for him who is hard of hearing. Rather, extend to him a helping hand. Bid him be of good cheer. Give him his "message to Garcia" and expect him to carry it through.

CONCLUSION

Permit me to close on this optimistic note. We have been discussing a different form of therapy than appears in our pharmacopœia. May I offer in compressed, shall we say, tabloid, form the following corrective measures? Perhaps one might be taken each night on retiring. They are not easy to digest and assimilate. It requires deliberate and earnest effort on the part of the patient. But given the will to do and the

courage to carry-on, I think you can promise him that sleep will be less troubled and the morrow's serener waking may find "the hill-side's dew-pearled; the lark's on the wing;—all's right with the world". I have called them the Nine Commandments for the Hard of Hearing.

THE NINE COMMANDMENTS FOR THE HARD OF HEARING

I. Thou shalt frankly confess thy deafness to thyself and before thy fellow men. Let there be no deceit nor false pride.

II. Thou shalt not covet thy neighbour's hearing, but shalt rejoice that thou livest in an age when thy handicap can be made so small.

III. Early and again shalt thou consult thy otologist and accept every scientific aid he can render.

IV. Eschew the quack and his devices. Easy and broad is the way to his door and many there be that find it.

V. Thou shalt join and work for a League for the Hard of Hearing where thou wilt receive encouragement and stimulation for thyself and wilt find happiness in serving thy brother. Thus wilt thou march forward with the Federation army that is alleviating deafness throughout the world.

VI. So love thy neighbour that thou do everything in thy power to help him when he would have speech with thee. To this end:

VII. Thou shalt study lip-reading in season and out of season.

VIII. Thou shalt secure and use the best ear-phone thou canst discover.

IX. Triumphantly shalt thou rise above thine infirmity, and so conduct thy life that the world hath need of thee.

FUNDAMENTALS IN RECTAL DIAGNOSIS

By E. A. DANIELS, M.Sc., M.D.,

*Clinical Assistant, St. Mark's Hospital for Cancer, Fistula and
Other Diseases of the Rectum,*
London, Eng.*

MEDICINE has been slow in accepting the investigation and treatment of rectal affections as its own responsibility, and thus rescuing from the hands of unqualified persons and the charlatan this important branch of the healing art.

RECTAL DIAGNOSIS

Rectal diagnosis, properly carried out, necessitates not only a knowledge of the normal rectum and the various abnormalities to which it is subject but also a comprehensive knowledge of general medicine.³

A short history should be taken, and this is often a useful preliminary. Since the examination is one of direct observation, the history is not of such great importance as in other branches of medicine. It is quite trying to obtain an adequate history from patients suffering from rectal disturbances. The duration of the symptoms is of importance. The majority of patients will come complaining of an external lump, pain

or bleeding. Bleeding is an important symptom, and its character and relation to stool should be determined. The habits and past medical history of the patient are of importance. This applies particularly to the use of alcohol and the presence of a tuberculous lesion in some part of the body. However it is usually quite impossible to obtain a satisfactory history in a rectal case, either because of modesty or lack of proper observation by the patient. The examiner will usually find that the most fruitful source of information will be a careful and painstaking examination.

Next to the index finger in importance, there are a few instruments the employment of which is essential to the performance of a complete rectal examination. Proper illumination is essential, either by a light with a focusing lens, a head light, or a terminal light attached to the proctoscope. Several proctoscopes of different sizes are needed, preferably one each of the following: a Gabriel, a Milligan and a Bensaude. These are all of the Kelly, short rectoscope

* Prepared during tenure of assistantship—1933.

pattern. The Milligan and Bensaude are more tapering and of somewhat smaller bore. Since the proctoscope is only a few inches in length, as compared with the sigmoidoscope, one can gently pass it full length before withdrawing the plunger. Examination is performed during the withdrawal of the instrument. The patient should breathe through the mouth and not strain, until one is prepared to demonstrate the degree of hæmorrhoidal dilatation (if any be present) and whether there is redundant mucosa.

Next in importance is a sigmoidoscope of either the Strauss (as used at St. Mark's Hospital) or the Yeomans' type. The latter has the advantage of having a concealed light at the proximal end of the instrument in a separate arm, which is a great convenience if the bowel is not thoroughly cleaned out. The Strauss sigmoidoscope is simple in operation, has a length of 30 cm., and is quite satisfactory. It may be observed that there are sigmoidoscopes for infants on the market. There is no reason why, with gentleness, the ordinary adult form cannot be employed in children over two years old. Infants may pass stools as bulky and consistent as that of an adult, and in examining children one can gently pass the standard Strauss pattern. Of course in children, because of the comparative straightness of the terminal bowel, one can reach into the sigmoid at a much shorter distance than in an adult. In children under two years of age, if sigmoidoscopy should be necessary, one of the instruments of smaller diameter will have to be employed. In performing sigmoidoscopy in children, because of the excitement induced, a general anæsthetic is always necessary. On the other hand a general anæsthetic is never necessary in doing an ordinary proctoscopic examination. It is advisable in proctoscopying children first to gently stretch the sphincter by passing the index finger, well lubricated, and to complete the examination by using a small Bensaude proctoscope, or an infant proctoscope of the Kelly pattern. The diameters of the Kelly, Gabriel or Milligan proctoscopes are larger than that of the Strauss sigmoidoscope, and these large instruments are therefore not suited for children.

A patient presenting himself or herself with rectal symptoms must receive a painstaking examination. This examination must commence with a careful inspection of the anal region and the surrounding ischio-rectal regions. The con-

dition of the peri-anal skin is important, and excoriations, undue redness or pallor, will immediately lead one to suspect that irritation has been present, either as a primary pruritus ani or secondary to some anal or rectal lesion. One should observe the patient's underclothing for soiling which will lead one to suspect inadequate control of the anal outlet. (One would rather refer to continence as being more dependent upon the anal outlet than upon the external sphincter alone, because the ano-rectal ring is now regarded as of almost equal importance). One should carefully look for any loss of symmetry, as slight bulging on one side of the anus or fullness of one ischio-rectal region will lead one to suspect suppuration which is presenting at the skin surface. It must be remembered that the focus may be *supra levatorem* or even in the pelvic bones. External palpation is an important aid to diagnosis and will reveal the induration of fistulous tracts, fluctuation, or induration in the later rectal zones, and the degree of sphincter tone. The finger should systematically palpate all around the sphincter and ischio-rectal regions. Moreover, such a preliminary palpation gains the patient's confidence, and after a few moments general relaxation and ease will replace an attitude of strain.

The finger is now gently passed into the rectum and this examination must be thorough. It should be done deliberately, keeping in mind the various anatomical structures which surround and lie in proximity to the rectum. In men, it is important to decide about the condition of the prostate and the seminal vesicles. In the female, it is nearly always possible to get a good deal of valuable information concerning the pelvic organs through digital examination of the rectum. Rectal symptoms may be due to one of many extra-rectal lesions. Proper invagination of the palpating finger at its metacarpo-pharyngeal joint into the region between the tuberosities of the ischia is of far more importance than the actual length of one's finger. By gently and firmly invaginating one's index finger one can reach well into the ampulla of the rectum. Digital exploration of the anus, rectum and surrounding structures is a source of very valuable information if the procedure be carried out slowly and deliberately. During such an examination one should have a reasonable knowledge of what constitutes the normal. Haste in completing the examination is a great

source of error, and one should proceed slowly and at the same time review in one's mind the anatomical structures encountered. In passing, it may be here mentioned that one can never feel internal hemorrhoids unless they are thrombosed or have become polypoid. In order to determine their presence it is necessary to pass a proctoscope.

In conducting a proctoscopic or sigmoidoscopic examination the position of the patient is of great importance, if the procedure is to be completed without a struggle and with profit to the examiner. Improper or awkward positions will immediately handicap the examiner and render the examination difficult or impossible. For proctoscopy (by which one understands the passing of a short rectoscope of the Kelly, Gabriel or Milligan types, in contrast to a sigmoidoscope) the two desirable positions are the right or left lateral, and the knee-elbow. The knee-chest or knee-face positions will usually empty the hæmorrhoidal veins, and in withdrawing the instrument one will be lead to believe that internal hæmorrhoids are not present, when they may be truly present as a troublesome lesion. They actually have been emptied by passing the solid barrel of the proctoscope over them, and kept emptied by the almost inverted position of the rectum secured by the knee-chest or knee-face positions. If such a patient be placed in the lateral or knee-elbow positions, one may be surprised, on withdrawing the instrument and asking him to strain gently, at the presence of a large hæmorrhoidal ring prolapsing into the lumen of the instrument.

Sigmoidoscopy can be converted into a simple office procedure. The art of performing a successful sigmoidoscopic examination depends upon a few simplicities. Firstly, the patient should not be prepared by purgation, or forewarned, so that he comes trembling to the physician, expecting the worst; secondly, he should never see the instrument; and, thirdly, and most important of all, the proper position of the patient during examination. One loses a great deal of valuable information if the patient comes prepared by preliminary purgation and wash-outs. The object of sigmoidoscopy is to examine the rectum and sigmoid in as undisturbed a state as possible. Preliminary purgations and wash-outs produce congestion of the mucosa, generally wash away secretions, and induce a condition of irritability and even spasm of the sigmoid and rectum—

conditions not conducive to an easy examination. How often has one observed sigmoidoscopic reports of a congested mucous membrane which is really the result of preliminary purgation and wash-outs. It is best, if possible, to see a case for sigmoidoscopy in the afternoon, because most persons have a bowel movement in the morning. At the very most one may order a mild aperient pill, to be taken at bedtime. If some faeces are present, this is no bar to examination, as the instrument can sweep around them in most cases. If the ampulla is hopelessly loaded, the patient should be asked to return in a few days, when one will usually have better fortune. It cannot be stressed too strongly, that one must try to examine the rectum and sigmoid in their normal states, even if some faeces are present. Moreover the colour and consistency of the bowel contents are important in appraising the case.

In order to pass the sigmoidoscope smoothly and easily the true pelvis must be emptied of coils of small intestine, and the rectum and sigmoid inverted as much as possible. This is only possible by careful posturing of the patient into the knee-chest, or better the knee-chest-face, position with the small of the back well hollowed out. The knees are spread apart. A solid table lends assurance to the patient. It is well worth one's while to spend several moments posturing a patient before commencing the examination. In the knee-elbow or lateral positions the pelvis is usually filled with loops of small bowel and in passing the instrument the patient will suffer much. The instrument is passed under direct vision, the plunger being withdrawn as soon as the sphincter is passed. It is not necessary to distend the bowel by making too frequent use of the attached rubber bag inflator. A slight pump occasionally will suffice, thus displacing the bit of redundant bowel ahead a little at a time. One should ordinarily be able to pass the instrument to a distance of between 20 to 26 cm. without any difficulty. One thing must be pointed out concerning sigmoidoscopy. *Every patient cannot be sigmoidoscoped* (any more than one can cure every fistula without producing incontinence). About 5 per cent of people, because of anatomical reasons, whether this be a very marked promontory of the sacrum or a short mesosigmoid, cannot be sigmoidoscoped. This fact must be known if one is to avoid damaging the bowel. It is better to try again

than to make the patient suffer and traumatize the intestine.

Sigmoidoscopy, properly performed, whilst somewhat annoying and uncomfortable to the patient, should not produce suffering, and if this follows one should desist immediately. Anæsthesia is very seldom needed in any form, and making this method of examining the bowel a simple office procedure will mean that cancer will be more often detected in a portion of the intestinal tract which is frequently the site of malignant lesions.

In rectal diagnosis one cannot over-emphasize the importance of a complete examination in every case, which should include the bowel from anus to sigmoid. The reason for this is the occurrence of double lesions. A patient with an anal fissure may have an ampullary cancer as also may the one with hæmorrhoids. A barium examination may also have to supplement the sigmoidoscopic examination. Moreover, a patient may have an ampullary growth with a second growth in the sigmoid. This is often the case where malignancy has been superimposed upon a benign adenoma. Since adenomata are usually multiple, the occurrence of multiple malignancies should be kept in mind.

One can now pass on to the consideration of the various symptoms in cases suffering from rectal disease.

Pain.—One can say at the outset that any patient presenting himself with rectal pain of a severe character will usually be the subject of a lesion below the pectinate line. When a lesion is present above the pectinate line pain is seldom present. Instead the patient presents other symptoms, such as a troublesome discharge, backache, a feeling of fullness in the bowel, some degree of tenesmus, straining after stool, or digestive upsets. This relative absence of pain in lesions above the pectinate line is unfortunate, because of the late diagnosis of cancer of the rectum in many cases; and again it calls for the most searching examination of the rectum and sigmoid in any obscure case. No patient with anæmia, dyspepsia, back-pain, or constipation should be discharged without a complete rectal examination. It is not sufficient merely to pass the finger, because only about 50 per cent of rectal carcinomata are within reach of the average index finger, and if proper invagination of the finger is not exercised this percentage will be considerably reduced.

The most painful of all ano-rectal conditions is dorsal fissure of the anus. In about 95 per cent of the cases this lesion is present in the posterior aspect of the anus, usually in the mid-line, but it may be slightly lateral. The pain is exquisite and is accompanied by spasm of the external sphincter. In chronic cases, after the formation of the sentinel pile there is actual fibrosis of the external sphincter and its surrounding connective tissue. Such a case will present an anus beyond which it is quite impossible to pass one's finger, no matter how gently one proceeds. It is now advisable to desist, and a complete examination deferred to a future date. Meantime the fissure is demonstrated by urging the patient to relax, and by gently retracting the anal margins. The patient is now asked to bear down. In nearly all cases, at the posterior aspect of the anus, very near the mucocutaneous border, a small acutely inflamed ulcer will be found. This may be undermined at its base and have a submucous abscess extending above it. The lesion bleeds easily. Except in chronic fissures there is very little induration.

A differential diagnosis of anal fissure is important, because this lesion may be confused, especially in its chronic states, with anal chancre, epithelioma, or anal tuberculosis. A tuberculous ulcer of the anus will fail to respond to local treatment, and the ulcer will gradually enlarge and present undermined margins. Primary chancre of the anus early shows marked induration of its periphery, which is never observed in a fresh fissure. The inguinal glands quickly enlarge, and the Wassermann reaction becomes positive very early in primary sore of the anus. A fissure of many weeks' standing has many of the appearances of primary chancre of the anus and the differential diagnosis is often a very subtle one. Primary syphilitic lesions of the anus are not uncommon, and one should never overlook their possibility. Dark field illumination of a scraping from the ulcer surface is valuable. Squamous carcinoma of the anus may resemble a chronic fissure (often also quite indurated). Microscopic examination of a snipping is the only certain method of completing the diagnosis in such doubtful cases.

Submucous abscess of the rectum produces a dull throbbing pain, felt low down in the rectum. This is the result of a fissure, cryptitis, and fistulæ whose drainage may have become arrested. Fever may be present, and one can feel a cord-

like induration extending up from the anus, which is exquisitely tender.

Another frequent cause of rectal pain is an anal hæmatoma, better known as an "external thrombotic pile". This presents at the anal margin as one or more blue tense swellings containing blood clots. It comes on suddenly, and the pain and discomfort are distressing. Simple inspection of the anus provides one with the diagnosis.

Internal hæmorrhoids which have become prolapsed and swollen will produce severe pain. The sphincter will, through its spasm, "choke off" the prolapsed hæmorrhoids, and necrosis, sloughing and infection will ensue. It is extremely rare and almost unknown (Gabriel), for sloughing thrombosed infected piles to lead to portal pyæmia. The writer recently observed a patient, admitted to hospital, with a large mass of sloughing necrotic prolapsed piles. The patient was toxic and there was great abdominal distension, with icterus of the conjunctivæ. Fever was high and the respiratory rate increased. The liver was slightly enlarged and tender on palpation. A diagnosis of portal pyæmia and septicæmia was made. The patient died soon after admission, and at autopsy the liver showed no sepsis and the portal system was normal. There was consolidation of the right lower lobe of the lung, which dullness at examination, because of the absence of pneumonic symptoms, was taken to be upward enlargement of the liver compressing the lung. The early cough no doubt brought the hæmorrhoids down and sloughing ensued. Cough in this case was no longer present on admission, no doubt because of great toxicity; and the downward enlargement and tenderness of the liver were no doubt cardiac in nature. Therefore in sloughing necrotic piles, with signs of sepsis, one should make a thorough search for a pneumonic lesion.

The continued ingestion of saline cathartics, with the long-continued passing of liquid stools, will produce a red congested anus and a spasmodic or even fibrous sphincter. Some pain and much irritation will ensue.

Another cause of rectal pain is the injudicious injection of hæmorrhoids, either by incorrect technique or injecting cases not suitable for such treatment. Upon examination, one may observe an infected ulcer of the rectum with submucous or pararectal suppuration. One must never fail

to enquire about previous treatment in any case of rectal ulceration or infection.

Amongst other causes of rectal pain are the impaction of foreign bodies into the lower rectum, such as bits of fish, or chicken bone and peri-rectal or peri-anal suppuration. Injudicious prostatic massage, rectal ulceration from cervical radiation, and sodomy or impalement of the rectum are rarer causes of rectal pain. The taking of a careful history and the performing of a thorough examination will soon demonstrate the cause in such cases. Proctitis, whether gonorrhæal or non-specific seldom causes rectal pain.

Rectal cancer is seldom a painful lesion, and actual pain only occurs if the cancer extends down below the pectinate line and involves the anus. Lateral spread also causes late pain. Other troublesome symptoms, rather than pain, are characteristic of cancer of the rectum.

Bleeding.—Bleeding from the rectum is most commonly caused by internal hæmorrhoids, and fissure *in ano*. In the former the stool may be spattered, only if there is sphincteric spasm. Where the sphincter is patulous, as the result of prolapse of the piles, a trickle of blood will occur with and also between stools. On passing a proctoscope in a case of piles of long standing, one is often impressed by the marked pallor of the rectal mucosa, evidence of a secondary anaemia. The methods already described will be employed to diagnose hæmorrhoids and fissure *in ano*. Fissure *in ano*, even in its chronic variety, may cause free rectal bleeding. Rectal cancer does not as a rule cause bleeding until the lesion has become advanced enough to produce central sloughing and ulceration of the growth, and therefore one must not regard bleeding *per rectum* as an early symptom of rectal malignancy (Duke's classification of rectal cancer).⁴

The benign tumours of epithelial origin, adenomata and papillomata, may cause free rectal bleeding. Sigmoidoscopy will reveal these lesions. The former are seen as one or more sessile swellings in the sigmoid and upper rectum, of a deeper red colour than the ordinary mucous membrane. The papillomata are soft villous growths, which bleed freely. One must mention the unfortunate disease, "Familial polyposis intestini", which may run through several or many generations of the family, and which is characterized by bleeding and anaemia

cases. In 6 of these it was 5 pounds or below, which indicates that 66 per cent were premature infants. The age at which treatment was sought for the condition in the full-term infants was from 12 to 17 months. In the prematurely-born infants it was, with one exception, under one year. It has been found that any infant, regardless of the period of gestation, contains 3 times as much iron in proportion to its weight as a child over 1 year of age.⁶ In other words, the new-born child can triple its birth weight without developing anæmia, on a milk diet, which of necessity is low in iron. The prematurely-born infant triples the birth weight at less than 1 year of age, and the full-term at one year, on an average. Anæmia should not develop until after that point in development is reached. This small series of cases supports this view.

The history and findings on the first visit were the same in practically every instance. The children had anorexia; milk was the sole food, and solids were refused. They showed pallor and listlessness, and a hæmie murmur was found in many. The hæmoglobin values ranged from 32 to 50 per cent. After the feeding of iron ammonium citrate in the formula marked improvement was invariably noticed. The mothers reported that the infants began to eat solid food with enthusiasm, without coaxing or forcing, and became active and energetic. The colour improved and there was a noticeably rapid gain in weight. The hæmoglobin values are recorded. In the two with the lowest initial percentage there was 100 per cent increase in the hæmoglobin in 1 week, after which the rise was slow. In most instances where the observation was made early, it was found that the initial rise was very rapid to approximately 65 per cent, and the subsequent rise took a period of one to two months.

Iron⁷ is absorbed from the gastrointestinal tract in the ferrous form. Iron and ammonium citrate in the stomach is changed to ferrous and ferric chloride. The proportions of these two depend on the amount of reducing substances in the food. If the reducing substances in the food are increased the proportion of ferrous salt is raised. A mixed diet containing meat and vegetables has a large quantity of reducing substances, and so with this diet the proportion of ferrous chloride is high when iron is administered. Likewise, the amount of

ferrous chloride formed in the stomach varies directly as the amount of iron present. In other words, small amounts of iron and ammonium citrate will gradually all be changed to ferric chloride or the unavailable form. If, however, a larger quantity of iron and ammonium citrate is given, the proportion of the ferrous salt is raised. This explains the necessity of such large doses as advocated in this report.

In animal experimentation large doses of ferrous chloride cause vomiting, diarrhœa, diuresis, and anorexia. If the total quantity of iron and ammonium citrate administered here were changed to ferrous chloride undoubtedly there would be toxic symptoms. However, a milk or milk and cereal diet contains only small quantities of reducing substances, so that the quantity of iron must be high to have the ferrous salt formed. No toxic symptoms were observed in any of the patients treated in this series, although diarrhœa has been observed in some older children where the diet was more varied.

When such rapid and striking results as these can be obtained with the quantities of iron used here, it would seem that unless there is some other reason for transfusion, this is not necessary in the treatment of dietary anæmia. Treatment by iron is much less expensive, more easily administered, allows the child to produce a natural cure, and obviates the danger of cross-infection. If, however, infection is present, immediate transfusion is indicated to raise the resistance, and this should be followed by iron therapy.

In the pharmacopœia the adult dose for iron ammonium citrate is given as 5 to 10 grains. If proportional doses are used in infants the results are bound to be poor and there will be a slow response. In these patients 60 to 120 grains daily have been used at the commencement of treatment. Due to its extreme solubility this is an excellent form of iron to use, as it may be administered to infants in the formula or in any other fluid vehicle that is taken readily, such as orange juice.

SUMMARY

Ten cases of dietary anæmia were treated with iron and ammonium citrate in doses of 60 to 120 grains daily, which was dissolved in the milk feeding for the day. This was found to be

a convenient form in which to give iron. No untoward effects were observed from the use of the large doses prescribed.

There was a rapid improvement in the appetite, activity, colour, weight, and general physical state of each infant. The haemoglobin rose very rapidly for the initial period, and subsequently slowly approached the normal level.

When such rapid and striking improvement can be obtained with iron alone the necessity for the use of transfusions in the treatment of dietary anaemia is greatly diminished, unless indicated by some complication.

Sixty-six per cent of these infants had a birth weight of 5 lbs. or less. In this group the anaemia developed in the last quarter of the first year. The full term infants did not ap-

pear for treatment of the anaemia till after 1 year of age.

REFERENCES

1. SMILING, C. E. AND BROWN, A.: Clinical application to hematology in infants and children, *Canad. M. Ass. J.*, 1931, 30: 488.
2. LUCAS, W. P. AND WASHBURN, H. H.: Clinical Pediatrics, Appleton, Phila., 1928, vol. 11.
3. PARSONS, L. G., SHEMAN, E. M., HAWESLEY, J. C., SFALL, A. V. AND GITTINS, R. J.: Anaemia in infancy and childhood, *Arch. Dis. Child.*, 1933, 8: 85, 95, 117 and 227.
4. JOSEPHS, H. W.: Treatment of anaemia of infancy with iron and copper, *Bull. Johns Hopkins Hosp.*, 1931, 49: 246.
5. BLACEFAN, K. D., BATY, J. M. AND DIAMOND, L. K.: The anaemias of childhood, Oxford Monographs, 1930, 9: chap. 25.
6. SHEMAN, H. C.: Chemistry of Food and Nutrition, 3rd ed., Macmillan, New York, 1929.
7. LUCAS, G. H. W.: University of Toronto personal communications.
8. HAET, E. B., STEENBOEK, H., WADDELL, J. AND ELVERJEM, C. A.: Iron in nutrition, copper as supplement to iron for haemoglobin building in rat, *J. Biol. Chem.*, 1928, 77: 797.
9. GITTINS, J. C. AND STEWART, W. B.: Anaemias of childhood, *Atlantic Med. J.*, 1927, 30: 605.
10. HILL, L. W.: Pigment and iron in infant's diet—their relation to haemoglobin formation, *Pediatr. M. & S. J.*, 1921, 191: 312. Nutritional anaemia in infancy, deficiency diseases, *New Eng. Med. J.*, 1929, 201: 261.
11. SCHWARTZ, H. AND ROSENTHAL, N.: Chlorotic type of anaemia in infants, *Arch. of Ped.*, 1920, 37: 1.

SPINELLI OPERATION FOLLOWED BY PREGNANCY AND LABOUR

By W. PELTON TEW, M.B., F.R.C.S.(Ed.), F.R.C.S.(C.), M.C.O.G.,

London, Ont.

NORMAN F. MILLER¹ in 1927 collected 55 cases from the literature and reported one of his own of inversion of the uterus followed by pregnancy. In this group of cases the youngest patient recorded was 18 years of age. The original inversion existed six weeks before it was repaired by Piccoli's incision. Two subsequent pregnancies occurred, both terminating normally. The oldest patient in Miller's group was 37. There were 16 primiparae and 21 multiparae; the parity of the rest of the group was not stated. Fifteen of the group were corrected immediately. The average duration for the whole group was 33 days. The longest interval was 12 months. Four of the group underwent spontaneous replacement after several attempts at manual replacement. The average duration of the inversion for these cases was nine months; the longest duration in any one case was five years.

The 55 cases reported by Miller were corrected as follows. Twenty-five were replaced manually; 8 underwent spontaneous replacement; 22 were corrected by operation. Eight of the operative corrections were made by Piccoli's method; two by the combined Piccoli-Borelius-Westermann method; three by the Kustner operation; five

by the Spinelli operation; one by the Kustner-Borelius-Westermann operation; one by Kehrer's method, and one by Duret's method.

Inversion did not recur in subsequent pregnancies among the 22 cases corrected by operation; it occurred 11 times in the 25 cases corrected manually. There were only three cases of subsequent abortions among the cases reported. Adherent placenta occurred in the subsequent pregnancies in 40 per cent of the cases corrected manually, and in 18 per cent of the cases corrected by operation. Twenty-nine confinements were reported afterwards in the 22 cases corrected by operation. Uterine rupture did not occur in any case.

From this report it would appear that conservative management of pregnancy and labour is the method of choice for cases of pregnancy following corrected uterine inversions. This holds true for cases manually corrected and for cases corrected by operation, providing the post-operative convalescence is afebrile. The possibility of rupture of the uterus should be kept in mind, but seemingly the chances of it occurring are not very great.

Miller reported 22 cases of pregnancy and labour following operative correction of uterine

inversion. Of this group 5 cases were corrected by the Spinelli operation. The following case was corrected by the Spinelli operation.

Mrs. C.B., aged twenty-nine, presented herself at the out-patient Gynaecological Clinic, Victoria Hospital, London, Ont., on February 25, 1931. Her past history was as follows. She was confined with her first baby in Ottawa. The record of this confinement was not looked up. Her second confinement was on October 15, 1927, in Victoria Hospital, London, Ont. This labour lasted five and a half hours. The delivery was spontaneous and the baby weighed seven pounds ten ounces. The mother and baby both left the hospital under normal circumstances on the tenth day following labour. She was then a semi-private patient. Her third confinement was on March 3, 1929. This labour lasted four hours and the delivery was spontaneous. The following is a quotation of the house-surgeon's notes concerning the delivery of the placenta. "On expression of the placenta by Cr  d  's method it was found very adherent. On traction a mass was brought forward the size of an adult fist. The membranes were separated and the placenta delivered. A hand was inserted into the uterus and a submucous pedunculated fibroid (?) growing from the posterior wall of the fundus was found."

Some of the nurse's notes on the history were as follows. "Placenta expelled with difficulty. Ergot, one ampoule, and pituitrin, one ampoule, given. Considerable h  morrhage; pulse weak at times. Condition fair as patient was moved from the labour room to her own. Two hours after delivery the perineal pads were quite saturated. No complaints of pain. Five hours after delivery pulse rather weak; condition fair. The following morning there was no severe flowing." From then on the flowing gradually decreased. The mother nursed her baby. The patient was discharged from the hospital on the twelfth day with a normal temperature and a pulse rate of ninety. Her average temperature was about 100   and her average pulse rate about 100 during the eleven days following confinement.

The patient stated that after leaving the hospital a mass protruded from the vagina when she was on her feet. This mass gradually decreased in size and

receded. It finally would appear only during her menstrual periods. A diagnosis of a completely inverted uterus was made and the patient was admitted to the Indoor Service. She was menstruating on the day of admittance to the hospital. The inverted uterus was protruding through the vulvar orifice, and we had the opportunity of observing the interior of the uterus weeping droplets of blood during a menstrual period. There was a moderate amount of flowing on February 26th, 27th, and 28th. On March 1st there was very little flow; on March 3rd the period was over. There was a pinkish discharge for the next two or three days. The uterus gradually receded into the vagina. The patient stated that the uterus (or mass) had been protruding in this manner with each of her menstrual periods during the past two years. On March 12th I performed the Spinelli operation. On March 30th she was up for the first time and was discharged from the hospital on April 3rd with the pelvis very satisfactory.

On leaving the hospital the patient was requested to return to the Out-door Gynaecological Clinic periodically for examination. She was also advised to avoid pregnancy for about one year. The subsequent examinations of the pelvis proved it to be comparatively normal; her menstrual periods were perfectly normal.

On November 30, 1933, the patient presented herself at my office stating that her last normal period was April 28, 1933. On examination I found her to be about seven months pregnant, and I arranged for her to attend the pre-natal clinic. She was confined on December 30, 1933. The duration of the labour was four hours and the delivery was spontaneous. The baby weighed five pounds, two and three-quarter ounces. This was no doubt due to the fact that labour began about three weeks prematurely. The baby was vigorous and did well from birth. The placenta came away rather reluctantly at the end of an hour, with the help of the Cr  d   method. The puerperal period was normal, and on discharge from the hospital on the fourteenth day after delivery the uterus was well involuted and the pelvis seemed normal.

REFERENCE

1. MILLER, N. F.: Pregnancy following inversion of the uterus, *Am. J. Obst. & Gyn.*, 1927, 13: 307.

THE ROLE OF THE PATHOLOGIST IN THE DIAGNOSIS OF CANCER*

BY W. L. ROBINSON, M.B.,

Toronto

"THE r  le of the pathologist in the diagnosis of cancer"; I am glad the subject is stated thus and not as "The r  le of the microscope", or "The r  le of the laboratory". The human element, the pathologist, is recognized. In these days of delicate instruments of superb scientific exactitude and serological reactions of almost unbelievable accuracy, we are prone,

I believe, to rely unduly upon things mechanical and chemical and to forget the humanism in things scientific and religious. The world has been dominated, says Whitehead, for three centuries by science. This is reflected in our materialistic concepts of everyday life and our faith in the reality and certainty of matter. The modern physicists and philosophers, however, are showing us the uncertainty of such concepts, and are emphasizing the importance of mind and the concrete reality of its existence. And so while we have today at our disposal beautifully equipped laboratories, with machines for cutting sections film-like in

* A paper read before the combined meeting of the Section of Pathology with the Section of Surgery, Academy of Medicine, Toronto, on January 24, 1933.

Earlier articles in the series on the diagnosis of cancer can be found in the *Journal* as follows:—1933, 29: 465; 1934, 30: 46, 48, 50, 168, 171, 280, 283, 522, 639; 31: 9, 165.

thickness, an almost endless variety of dyes for staining them, and microscopes that would have delighted beyond measure the heart of Virchow, we are still dependent for the diagnosing of pathological material upon the human element. I do not wish, however, to belittle those physical accessories which combine to make our modern laboratories so efficient and delightful to work in. They are a very important part of the scheme, and in the stress of modern medical diagnosing are becoming more and more of a necessity.

The study of morbid histology was begun less than one hundred years ago. Much was expected of it, particularly in reference to the study of tumours, and, while it has failed to answer all of the questions, it has contributed more to our knowledge of tumours than any other method. But it has its limitations, and for this reason will not be likely to contribute anything further of a dramatic nature to the advancement of our knowledge. To those, however, who recognize its limitations it has a great deal more reliable information to impart than any of the more modern and much boasted biochemical and biophysical methods of present-day investigation. Its technique is sound, but not thrilling; exacting, but not infallible; scientific, but not materialistic.

The pathologist, like the radiologist and the surgeon, in approaching his problem must have a background of experience and of training in the appreciation of the normal, such as the embryological development of the body, the histological appearances of the various cells and tissues which go to make up that body, and the ability to evaluate the limits of physiological change which occur in those tissues. In other words, this means a good understanding of the normal. He must then have behind him reliable technicians and assistants and the best mechanical equipment that can be afforded. He must have a thorough understanding of the whole process of tissue-embedding, sectioning and staining. Technique is something that can very seldom be left to the technician. A constant check has to be kept on this work. Many a poor diagnosis can be traced back to faulty technique. Such being the case, no effort should be spared to keep it up to as near the perfect level as possible.

The gross features of the tumour are next to be considered, and here let me say that I think

it probably just as important for the surgeon to have an appreciation of these as it is for the pathologist. We are absolutely dependent upon him many times for the choice of representative pieces of tissue. To do this intelligently he must have an understanding of the gross appearances of tumours and the characteristics of their growth. For instance, a block taken from the centre of a growth is often valueless. A piece scraped off the top is not only very difficult to handle from a technical standpoint, but is usually very inconclusive and trying on the nerves of the pathologist who is called upon to assume responsibility for the diagnosis. When a goodly portion, or the whole of the tumour, has been submitted the choice of blocks then lies with the pathologist. Under such circumstances the difficulties of diagnosing become largely histological. The gross features, moreover, play their part in indicating leads along which the mind can travel in its search for the solution of the problem. The surgeon by sending to the pathologist good representative portions of the tumour relieves himself of considerable responsibility, and makes it much easier for the pathologist to proceed with his study. Just a word here about biopsies. A biopsy or the removal of a portion of tumour growth from the living body is generally considered now to be a fairly safe as well as sound procedure, providing that in cases where malignancy is diagnosed treatment is not too long delayed, say not more than a week or ten days.

While we are on the subject of sending things to the pathologist I should like to rectify a false impression which we sometimes believe exists in the minds of clinicians, *viz.*, that we are independent or above the need for clinical assistance in the way of historical facts of the case. I have known clinicians to express a desire to withhold all history of the case, fearing that it might bias us in the formation of our opinion. Of course this is true, but not in the sense in which it was meant. Sometimes it simplifies things tremendously to have some idea of what the problem is from a clinical standpoint. Such things as the age and sex of the patient, duration and location of the growth, whether or not there had been previous x-ray or radium treatment, and whether or not an operation had recently been performed. All these give us a setting in which to place our problem, and from it we can very much more intelligently approach

it and offer you in return dividends incomparably better than if otherwise conducted. After all, the diagnosing of tumours should not be allowed to degenerate into a game of mental gymnastics or a battle of wits between clinician and pathologist. We are all working for the one end—the ultimate good of the patient. Pride in our skill must take a subsidiary place.

We come now to the microscopical examination of the tumour. We are enabled here to learn something of the detailed structure of the growth in question. Inflammatory lesions, traumatic reactions, and physiological hyperplasia have to be eliminated. As a rule these are readily recognized. Sometimes, however, they present a very difficult problem which is confusing and hard to solve. Lymphosarcomata and some of the endotheliomata are examples of such conditions. At times it is with considerable difficulty that we are able to distinguish these from inflammatory reactions.

In the case of a true tumour we are able by the use of the microscope to identify cell structure, cell type, and cell differentiation. This however, is not always a simple procedure. While there are certain fundamental characteristics of malignancy, these are not all necessarily manifested in the one growth. The variability of cell types also increases the difficulty of our problem. There are some fifteen to twenty different types of cells in the body, any one of which may give rise to a tumour. There is also a variability in cell differentiation within each group of tumours.

The pathologist recognizes very early in his career that there is no standard picture of a cancer that can be taken as a guide. In probably 90 per cent of the cases there is no difficulty. This percentage however is getting less and less, and, *vice versa*, our problem is getting greater and greater. Without a doubt this is due to the increased interest manifested by the laity and profession in the ferreting out of suspicious lumps with which the human frame seems to be so frequently cursed. The 10 per cent represents our difficulties. Inadequate amounts of the tumour tissue sent in for examination, or insufficient history accompanying it, keep this percentage unnecessarily large. When these are eliminated we still have a definite percentage to worry about, and here all the skill and technique available must be brought into play.

In the final analysis there are only some three or four features revealed by the microscope upon which we have to evaluate the growth. First, the general characteristics, such as evidence of infiltration of the growth into surrounding normal tissues. This, of course, presupposes that a proper section has been taken from the growing margin. It is not, however, always apparent, even when numerous sections are taken from various areas. Many benign tumours also have this same characteristic, for example—moles, angiomas, giant-cell tumours.

Secondly, the arrangement of the tumour cells, one with another and with the surrounding stroma. To evaluate this, of course, a thorough understanding of normal physiological and inflammatory variations must be constantly kept in mind. In the 90 per cent infiltration is usually present, and is, of course, a great aid. In the 10 per cent it is very often lacking; that is, the cells all appear fairly normal in their arrangement, one with another and with surrounding stroma cells.

We are coming now to our last stand, the most important and critical, and often the only, point on which a diagnosis is made. I refer to the typical or atypical characteristics of the individual cells. Now we are not "one-cell pathologists". There are some who claim to be able to identify an individual cancer cell. Very few pathologists have the temerity to admit of such skill or even to agree that it is possible. In evaluating the divergence from normal to cancer cells, I believe judgment passed upon one cell is quite unsound. The whole picture with many fields must be studied under the microscope. If doubt still exists, more blocks should be put through; it is surprising how this latter simple procedure so often clears up the obscurity of the first blocks and makes the diagnosis comparatively easy. These atypical features of cancer cells are sometimes quite obvious to the trained eye. At other times the variation from normal is so slight that one forms his opinion almost by intuition: it may be just a little increased density or intensity of staining of the nuclei; a prominence of the nucleoli; a variation in the size of the cells; or a disproportion in the volume of cytoplasm as compared with that of the nucleus, that one feels is not normal. I mention these points to show you that the diagnosing of cancer is not an exact science, that it is not governed by any known

set of rules. It is really an opinion given by the pathologist based upon certain evidence as revealed by the gross and microscopic appearances.

I feel that the clinician up to a certain point can diagnose with confidence and certainty a definite percentage of malignant tumour growths that come to his attention. There may lurk however in his mind the element of doubt, and he may feel a desire for confirmation before he takes a radical step which may involve the patient in needless expense or danger of life. The same might be said for the radiologist. Now I am not trying to belittle their skill, for in many cases I know one can quite confidently take their opinions as final. However, whether for confirmation or diagnosis, all tumours, I believe, should be brought to the attention of the pathologist. Depending upon his skill and experience his diagnosis can be accepted with confidence in the vast majority of cases. He is equipped to reach more nearly the ideal of a perfect diagnosis than probably any other branch of medicine. I have left room, however, for the human error to creep in. This is the privilege of *Homo sapiens* living under the stress of modern civilization. Such a state, however, is not ideal. I believe that it can be consider-

ably improved. New knowledge comes by experience and experiment. In our routine work we have little time for experiment, but we do have splendid opportunities for experience. This latter can be tremendously enhanced by an increase in volume of the material for study purposes and the improvement of facilities for keeping records, particularly follow-up records. These are of immense value and enable one constantly to repair and reinforce the foundation upon which our whole scheme of diagnosis is built. In the unusual cases the final diagnosis should not be left with the pathologist alone, or in fact with any one person or medical division. All the forces at our command must be brought into play. Rivalry in skill must be set aside, and the problem attacked in a group manner. The clinician, radiologist, pathologist, and any others who have anything to contribute should sit down together, as it were, and form a group opinion. This is not the expression of a desire on the part of the pathologist to evade his responsibilities. It is a desire to offer something a little better for the patient and something more exact for the clinician, thus approaching more nearly to the ideal which is the goal of every true follower of Hippocrates.

Case Reports

PITUITARY EXTRACT IN THE TREATMENT OF ALOPECIA*

By A. W. M. WHITE,

Toronto

In 1931, Bengston reported (*J. Am. M. Ass.*) that in the treatment of a case of Fröhlich's syndrome with anterior pituitary extract, a luxuriant growth of hair took place. This experience led him to treat in the same way a number of cases of alopecia uncomplicated by other signs of endocrine imbalance, and the reports of these cases showed surprisingly satisfactory results.

I wish now to report one case of alopecia totalis which has been under treatment for

eleven months. The treatment was undertaken at the earnest request of the patient who begged that something be done. The patient is a spinster of 73 years, who has always been healthy and has worked at dressmaking for almost 60 years. Generally speaking, there is nothing abnormal about her development, and she has made a success of her work all her life.

She stated that until she was 31 years of age she had beautiful hair, which was long and thick. At that time she noticed a small area the size of a twenty-five cent piece on the top of the head that was quite bald. This area gradually increased in size until within six weeks her hair had entirely disappeared. Within another few weeks the eyebrows, lashes and axillary and pubic hair was lost. She resorted to every type of treatment of which she heard, but without result. At times, usually about twice a year, there has appeared a fine fringe

* Read before the Section of Medicine, Academy of Medicine, Toronto, on March 13, 1934.

Editorial

RECENT STUDIES ON SILICOSIS

SILICON, in its many combinations and derivatives, is one of the most widely distributed elements in nature. It is found in many rocks and minerals, in most food-stuffs, particularly those of vegetable origin, and in nearly all dust. Consequently, it is constantly entering the animal body, and, to some extent, therefore, may be regarded as a normal constituent thereof. It has definitely been shown that silica in solution can exert a toxic action on the tissues. For example, it can produce coagulation necrosis of cells, fatty degeneration of the heart muscle, and necrosis of the liver parenchyma. That it does not produce harmful effects more often is perhaps linked up with the fact that it is readily excreted, the renal threshold for silica being low, as King, Stantial and Dolan¹ have proved. The dosage, also, would naturally have to be taken into account here. At any rate, so far as our present information goes, there is only one situation in the human body where the presence of silica is associated with pathological change, namely, the lung. The peculiar, and apparently specific, lesions in this organ attributed to silica are due to the inhalation of dust over prolonged periods, and are particularly related to certain occupations, such as mining, stone-cutting, sand-blasting, tool, axe, glass, slate, porcelain and silica grinding, moulding, vitreous enamel spraying, and abrasive soap manufacturing. Rarely, silicosis may develop where we would not suspect it, as in cotton-carders and in those engaged in polishing the heels of boots.

The chronic lesions produced in the lung by the inhalation of dust have been grouped in the past under the term "pneumonokoniosis," and a variety of this, due to silicon, was known as "silicosis." The Committee on Pneumonokoniosis of the Industrial Sec-

tion of the American Public Health Association recently defined silicosis as

"a disease due to breathing air containing silica (SiO_2), characterized anatomically by generalized fibrotic changes and the development of miliary nodulation in both lungs, and clinically by shortness of breath, decreased chest expansion, lessened capacity for work, absence of fever, increased susceptibility to tuberculosis (some or all of which symptoms may be present), and by characteristic x-ray findings."

This definition, which, as a matter of fact, is a description rather than a definition, by intention excludes disease produced by other kinds of dust, such as coal, asbestos, and talc dust. It is questionable if this is justifiable. For purposes of workmen's compensation silicosis is defined in Ontario more briefly as "fibrosis of the lungs due to the inhalation of silica dust."

The pathogenesis of silicosis may be epitomized as follows. The affection begins as a dry bronchiolitis. Dust-laden phagocytes accumulate in and about the intrapulmonary lymphoid tissue and pass into the lymphatics of the lung, eventually reaching the tracheo-bronchial lymph-nodes. Fibrous tissue gradually develops within these aggregations of phagocytes and characteristic laminated, hyaline, fibrous nodules are produced which ultimately undergo degeneration. These nodules gradually enlarge by extension at their periphery, so that further areas of pulmonary tissue become involved. It may prove to be the case, however, that the first manifestations of silicosis occur in the tracheo-bronchial lymph-nodes. The sequence of events is important.

Silicosis presents certain peculiar features, is a deadly disease, and constitutes in many countries a serious industrial hazard, so that it is not surprising that it has attracted widespread attention in recent years. Much good work has been done in Great Britain, South Africa, Canada, and the United States, partly in elucidating its pathogenesis and pathology, and partly in devising preventive

1. KING, E. J. AND STANTIAL, H.: Biochemistry of silicic acid, *Biochem. J.*, 1933, 27: 990.

KING, E. J., STANTIAL, H. AND DOLAN, M.: Biochemistry of silicic acid, *ibid.*, 1933, 27: 1002, 1007.

measures. In this connection we might cite certain papers emanating from the Banting Institute, Toronto, the most recent of which have been appearing in our *Journal*.² But despite intensive study many important points remain unsettled. We may ask, here, several questions. Is silicosis merely one form of pneumokoniosis, or is all pneumokoniosis silicosis? Is the agent which produces such serious changes in the lung silica, some other derivative of silicon, or a combination of substances, some siliceous and some not? What is the relationship between pulmonary tuberculosis and silicosis? What is the most efficient method of prevention?

From the pathologist's point of view it can be at once stated that there is room for the generic term "pneumonokoniosis", to cover all cases in which there is inhalation of dust with attendant tissue changes. We note that Prof. M. J. Stewart, of Leeds, adheres to the classical division of pneumokoniosis into anthracosis, silicosis, and siderosis, and adds the recently described entity, asbestosis. As asbestos is a silicate there seems to be no very good reason for separating it from other forms of silicosis, unless, indeed, on the basis of a somewhat different morbid anatomy. But, it has to be admitted that many dusts are comparatively innocuous, and, from the clinical point of view, silicosis is the all-important form of pneumokoniosis. Naturally, many dusts are compounds of varying substances. Thus, coal-miners, notably those working with anthracite, are exposed to mixtures of carbon and silica, and hæmatite workers, as in west Cumberland, England, to iron and silica. Usually it is to the silicotic element (SiO_2) to which the harmful effects in silicosis are attributed. More experimentation will be required before the relative degrees of toxicity of the various components of dust can be determined. This point has a bearing on the question of the relationship of

silicosis and tuberculosis. Some recent work of Prof. E. H. Kettle³ gives promise of affording us a ready means of classifying dusts. We quote the *Lancet's* account of this study (*The Lancet*, 1934, 1: 904). "Where a noxious dust reaches the lung through inhalation or through intratracheal injection, the first lesion to be observed is in the glands at its base. As early as three months after intratracheal injection of a suspension of crystalline silica, or of finely ground flint, changes can be observed in the pulmonary glands long before true silicotic lesions in the lungs are visible; but that these ultimately develop was shown by the examination of other animals in the same series which were allowed to survive for much longer periods. Control experiments with iron-coated silica and wellingtonite, both being inert dusts, showed merely a copious deposition of dust without any cellular activity or fibrosis. Since these observations were only incidental to the main object of the experiments, which was the study of the later pulmonary lesions, the earliest date at which the changes can be found was not ascertained. But it is clear that in the short space of three months or less it should be possible to estimate whether any given dust is likely to be among the active or inert dusts, though it is not claimed that a dust can be finally incriminated on indirect observations. Application of the method on a large scale might well result not only in a definite preliminary classification of dusts but in the establishment of standards by which any samples could be tested."

Until recently it has been fairly widely accepted that silicosis is due to the accumulation of silica (silicon dioxide, SiO_2) in the lungs. This silica does not produce its effects by mechanical irritation leading to death of phagocytes and productive fibrosis; rather, it is the silica which goes into solution that is toxic. Solution occurs through the action of alkaline substances and CO_2 , both of which, of course, can be found in the lymph and blood plasma of the lung, as elsewhere. This explanation is now doubted by some. W. R. Jones⁴ believes that a compound silicate—sericite—is the true cause of

2. KING, E. J. AND DOLAN, M.: Silicosis and the metabolism of silica, *Canad. M. Ass. J.*, 1934, 31: 21.

IRWIN, D. A.: The histological demonstration of siliceous material by microincineration, *ibid.*, 1934, 31: 135.

IRWIN, D. A.: Microincineration as an aid in the diagnosis of silicosis, *ibid.*, 1934, 31: 140.

ROBSON, W. D., IRWIN, D. A. AND KING, E. J.: Experimental silicosis, quartz, sericite, and irritating gases, *ibid.*, 1934, 31: 237.

FRANKS, W. R.: Silica dust, *ibid.*, 1934, 31: 245.

3. KETTLE, E. H.: The detection of dangerous dusts, *The Lancet*, 1934, 1: 889.

4. JONES, W. R.: Silicotic lungs; minerals they contain, *J. of Hygiene*, 1933, 33: 307.

silicosis. In this he is supported by Lyle Cummins, of Cardiff. Sericite belongs to the mica group and is a modification of muscovite, which is a hydrated potassium-aluminium silicate, but with varying amounts of SiO_2 in the molecule. It is somewhat fibrous, like asbestos, which can also produce fibrotic changes in the lungs. Jones' view is supported by the peculiar fact that silicosis is very frequent in the gold-miners of the Transvaal and rare in the Kolar gold-miners of India though much quartz dust is produced in the workings in both places. Similar differences in the distribution and frequency of silicosis have been noted also in Scotland, Wales and elsewhere. Prof. Lyle Cummins⁵ and Dr. Sladden think that Dr. Jones has made out a very good case in regard to the etiology of silicosis, and that his views, if confirmed, will explain many points now obscure in connection with the etiology of the disease. The point is being enquired into in various places at the present time, but cannot be considered as settled. The Canadian workers, Robson, Irwin, and King,⁶ do not find that sericite plays the leading rôle. These last mentioned observers have also (*loc. cit.*) investigated the part played by irritating gases, such as are produced in blasting, in the production of silicosis. They have found that when NO_2 and SO_2 are inhaled by the experimental animals degenerative lesions in the lungs and pneumonitis resulted. When these gases were inhaled together with silica dust a rapidly developing (acute) silicosis was produced.

It has long been known that silicosis and pulmonary tuberculosis were apt to be associated, to a degree that could not be attributed to coincidence. A large proportion of silicotic miners die of tuberculosis. On the other hand, coal miners, even if silicotic, tend to escape tuberculosis. Various theories have been advanced to explain this. One is that mechanical injury, by destroying many of the phagocytes in the lung lessens the resistance of the pulmonary tissues and

so favours the spread of infection. This can hardly be substantiated, for the theory would apply equally well to cases of anthracosis, in which, as we have stated, tuberculosis is not a common concomitant. Another theory is that silica in solution exerts a toxic and depressing influence on the cells, and, moreover, actually promotes the growth and activity of the tubercle bacillus. Prof. E. H. Kettle, in particular has investigated this question.⁷ He introduced into experimental animals, intratracheally, suspensions of various kinds of dust, with and without the addition of tubercle bacilli. Using an emulsion of killed tubercle bacilli, so as to mitigate the reaction, he found that when he introduced these with the active dusts the fibrotic process was accelerated, while the inert dusts remained quiescent in the pulmonary tissues or were gradually phagocytosed. He has found analogous results when the materials employed were injected subcutaneously. Experiments have also been made by other observers to determine the effect of adding silica to culture media on the growth of the tubercle bacillus. Some report an acceleration of growth under these conditions, but at the moment the findings require further confirmation and are not convincing.

In determining the relative rôles played by silica and the tubercle bacillus, it would seem desirable to determine, if possible, which condition comes first, tuberculosis or silicosis. This may be important. Bellander⁸ has advanced the idea that if tuberculosis has been in existence first a certain degree of silicosis may be, perhaps, of as much therapeutic value as a pneumothorax. Yet, though silicosis, by hastening cicatrization about a tuberculous focus, may delay the spread of the tuberculosis, the action of tuberculosis on previously existing silicosis is quite another matter. Attempts should be made to see if there is anything in this.

A.G.N.

5. CUMMINS, L. AND SLADDEN, A. F.: Letter in *Brit. M. J.*, 1934, 1: 554.

6. ROBSON, W. D., IRWIN, D. A. AND KING, E. J.: Experimental silicosis; quartz, sericite, and irritating gases, *Canad. M. Ass. J.*, 1934, 31:

7. KETTLE, E. H.: Experimental pneumoconiosis; infective silicosis, *J. Path. & Bact.*, 1934, 38: 201.

8. BELLANDER, J.: Silicosis in workers engaged in metal polishing and relation to tuberculosis, *Hygiea*, 1933, 95: 655.

THE INFLUENCE OF THE HYPOPHYSIS IN HYPERTENSION

It is now being widely recognized, though perhaps not as fully as it should be, that hypertension is not necessarily caused by arteriosclerosis, nor, indeed, that sclerosis necessarily even accompanies it. Particular stress has been in the past laid on sclerosis of the renal arterial system as being a causative factor of heightened pressure, but now we know that this relationship of cause and effect must be reversed. The sclerosis follows the rise in pressure. What causes the rise in the first instance is still obscure to us.

Dr. Harvey Cushing has recently brought forward a fresh theory regarding this unknown factor.¹ In brief, he suggests that the hypophysis, through its posterior lobe, plays a fundamental part in causing hypertension. He has been impressed by the fact that in an appreciable number of cases of hypertension the posterior lobe of the hypophysis shows a marked invasion by cells containing basophilic granules. He asks therefore whether it may not be possible that this basophilic infiltration is the factor activating the gland to produce its pressor substances which cause hypertension and its long trail of consequences. It has of course been known for many years that such a pressor substance is contained in the posterior lobe. That it is produced by the degeneration of certain cells which break down into hyaline-like masses has been observed in animals experimentally. It is Dr. Cushing's idea to link up the excess of abnormal cellular constituents (basophils) in the posterior lobe in man with hypertensive conditions. He quotes Cannon's experiments to show that the adrenal medulla may be quickly activated,

and it is reasonable to suppose that the hypophysis may be equally responsive: "in the case of the adrenal glands, however, we do not yet know just where to look microscopically for the cytological source of the pressor principle, whereas in the neurohypophysis we apparently now do."

If this theory is correct, then the posterior lobe should show basophilic infiltration in proportion to the degree of hypertensive disorders such as eclampsia and essential hypertension, with some relation also to the arteriosclerosis and hypertension of old age. Dr. Cushing's studies on a limited series of cases do lend support to this contention, but the series is not large. In six out of nine pituitary bodies from fatal cases of eclampsia a heavy infiltration of basophilic elements has been found in the posterior lobe, and the same condition has been seen in a number of glands from cases of essential hypertension and nephro-vascular disease. As additional evidence there is the fact that such infiltration is known to be common in old age. It has so far been regarded merely as a concomitant of that stage of life, but it is at least significant that then there should also be such a tendency to arteriosclerosis and hypertension. On the other hand, it is to be noted that such basophilic infiltration has been observed in the pituitary without any accompanying hypertension or arteriosclerosis.

Dr. Cushing, as we read him, by no means feels that he has solved the problem of what causes essential hypertension, but his suggestion regarding the part played by the hypophysis, and the train of observation by which he had been led up to his idea, will certainly be a stimulus to further investigation.

H.E.M.

1. Hyperactivation of the Neurohypophysis as the Pathological Basis of Eclampsia and other Hypertensive States, *Am. J. Path.*, 1934, 10: 145.

Editorial Comments

The Reorganization of our Association

Nineteen hundred and twenty-one was a critical year in the history of our Association. Debt was alarming, organization was defective, and a spirit of pessimism was rife. A Committee on Reorganization had been appointed at the Vancouver Meeting the year before, which Committee laid down certain general principles which seemed to it to be of paramount importance. It was recommended that,

to be strong, our Canadian Association should work along the lines of the American Medical Association; a much increased membership must be sought for; and the official journal of the Association must be made truly Dominion-wide in scope and influence. At the Halifax meeting in 1921 the final report of this Committee was presented, which detailed the responsibilities of the Provincial Associations towards the Dominion Association, and al

obligations of the national body to its members (see *Canad. M. Ass. J.*, 1921, 11: 689 *et seq.*). This report will, even now, repay perusal, as indicating the wise pre-vision of its members, and, in retrospect, the degree of progress made by our Association in the succeeding years. All that the Committee adumbrated at that time has been adopted, clarified, and extended, until now we have a most efficient organization. Three points stood out at the time as of prime importance—the imperative necessity of liquidating the Association debt, the establishment of a whole-time paid Secretariat, and the development of the *Journal* to the highest possible state of efficiency. To meet the first requirement it was decided to float a bond issue among the members for the sum of \$20,000, the bonds to be of the denomination of \$100.00 each, bearing interest at 5 per cent per annum for a term of ten years. An immediate appeal was made to the members present and some fifty of them at once responded to the call. A Committee was also appointed, representing the various provinces, to implement this action. The final result was most gratifying. The sum of \$15,800 was raised, 154 bonds being issued to members, 2 to a medical and surgical clinic and 2 to a Provincial Medical Association. Four bonds were not taken up. Those who subscribed must have done so with some little doubt as to the outcome, but that their faith was not misplaced is shown by the fact that the bonds were gradually retired, beginning in 1923, until the last was redeemed in 1928. The interest was faithfully paid. The gentlemen who took up these bonds were in a very real sense the saviours of our Association. They deserve our gratitude. Their names are preserved forever in our archives.

A General Secretary was appointed in the person of Dr. T. C. Routley, whose foresight, organizing ability, activity, and tact are accountable for much of our subsequent success. The wisdom of the idea and of the selection has been abundantly justified.

The conduct of the *Journal* was reorganized, a representative Editorial Board, with collaborators and provincial editorial committees, being established, and under the able editorship of Dr. A. D. Blackader the *Journal* began a new era of progress. It may truly be said that the *Canadian Medical Association Journal* is Dominion-wide in scope, and is endeavouring to live up to the ideals laid down for it by the Reorganization Committee. A.G.N.

Canada and the Traffic in Narcotic Drugs

The Report of the Narcotic Division of the Department of Pensions and National Health for the fiscal year ended March 31, 1933, has recently come to hand. It is satisfactory to note that it is the considered opinion of the Department that addiction to narcotics is not

on the increase in Canada. As compared with five years ago, the situation has greatly improved. The policy of imposing long periods of incarceration upon illicit traffickers has, apparently, had a beneficial effect. Not only have many flagrant offenders been removed from their sphere of operations but their fate has, undoubtedly, proved a deterrent to some others at least. The International Convention controlling and limiting the manufacture of narcotic drugs, which was signed at Geneva in July, 1931, became operative internationally on July 9, 1933, that is, about three months after the Report under review is dated. Therefore its full effects could not be appraised at the time the report was prepared, nor, indeed, could they have been apparent. Nevertheless, some improvement had already been seen, and the Report expresses the opinion, which is well-founded, that this Convention will prove a powerful aid to the cause of the control of narcotics by rendering it more difficult to obtain illicit supplies in large quantities.

During the judicial year ending September 30, 1932, the total number of convictions under the Opium and Narcotic Drug Act was 340, as compared with 333 in the preceding year, and with 458 and 567 in the two immediately preceding years. Convictions in connection with the illegal possession, importation of or selling of narcotics, however, decreased to 189, as compared with 221 in the preceding year, while those relating to smoking opium or frequenting opium dens increased to 147, as compared with 115. Why this is the case we need not speculate, as, no doubt, a number of factors, to us unknown, enter into the problem.

It is worthy of note that for the first time seizures of *Cannabis sativa* were made. This drug, which is closely allied to "hashish", is put up in the form of cigarettes, commonly known as "marihuana". According to recent information the use of these cigarettes has increased to a considerable extent in the United States and is now extending to Canada. This new menace is particularly formidable, in as much as the cigarettes are chiefly sold in dance halls and cabarets where young people not previously addicted to narcotics are apt to congregate. It is said that as much as \$1.25 each is charged for these "smokes".

The Report comments favourably on the very large measure of cooperation which is being given both by physicians and retail druggists, who seem to be alive to their responsibilities. In only one case was it found necessary to institute proceedings against a physician whose actions were obviously illicit, which actions resulted in a jail sentence. Although it may never be possible to stamp out the illicit traffic in narcotic drugs, yet the situation in this country has much improved, and, doubtless, will still more improve. One danger, however, should be pointed out. As the restrictions

against the manufacture and sale of narcotics are tightened up in Europe it is altogether likely that the illicit traffic in these drugs will acquire an impetus in oriental countries which will reach a target in Canada. A.G.N.

The Uncertainty of Dr. Robert G. Jackson's Age

We are all apt to hesitate for a moment or two in answering a question as to our age, and the hesitation is apt to become a little more pronounced each year. But when a man makes capital out of claiming an advanced age it behooves him to be a little more careful of these elusive years, especially if in his earlier days he has left here and there written statements regarding his age.

There is, or has been, for lately he has not been so much to the fore, a certain Dr. Robert G. Jackson who has been trying to impress upon an always impressionable public the value of a breakfast food called "Roman Meal". As is natural in this sort of impressionism, Dr. Jackson points to his own advanced age as proof of the virtues of this meal, the assumption being of course that he has fed heartily on it. He quite probably has fed thus; one would not want to doubt his word on that point. But that the meal has prolonged his life we are not prepared to accept without more convincing proof than his mere statement. Still less are we willing to believe that his life has been prolonged as long as he states. His public notices, as appearing in the newspapers, say that he is more than 75 years of age, which would make his birth year somewhere about 1859—we won't cavil at a year more or less. But in the course of his long life, Dr. Jackson has previously made statements regarding his age which are more modest in their claims, or, shall we say, more modern. In 1903, for example, he was admitted to the Jefferson Medical College of Philadelphia, and stated then that he was born in 1867. Later in life the hesitations of memory referred to began to appear, for in 1921, he said he was born in 1870. This information he gave to the American Medical Association for their directory, and they took it for what it was worth. But, being accurate people, they were disturbed, though probably not very much, by receiving another card from Dr. Jackson in 1933, in which he said he had been born in 1858. When asked to be more consistent in his statements, he replied that 1858 actually was his year of birth, but that as he had studied rather late in life he had foolishly tried to pass himself off among the "boys" as much younger than he really was. Presumably if his shyness keeps on wearing off

we will discover that 1858 is only another of his little attempts at keeping up with the boys. His method of estimating his age is evidently that which has been irreverently described in nautical language as "by guess and by God". It will be interesting indeed to see how many more years he discovers within himself at his next computation. H.E.M.

Dr. A. P. Procter

Our many readers will join with us in expressing our sincere regret at the dreadful misfortune which has come to Doctor Procter, of Vancouver, Secretary of the College of Physicians and Surgeons of British Columbia, and Chief Surgeon to the Canadian Pacific Railway. Doctor Procter was shot in his office by a conductor in the employ of the Railway who was the subject of Paget's disease, and whom Doctor Procter had, in pursuance of his duty, certified as unfit for work. The assailant then turned the revolver on himself and put a bullet through the jaw into his head; he is at the time of writing in a critical condition. We do not know the full extent of Doctor Procter's injuries, but are informed that when he was admitted to hospital he had hæmothorax. The bullet struck him in the lower part of the chest, passing through his body and embedding itself in the wall. Dastardly things like this have happened before and, doubtless, will again, and no medical man is free from such risk. After making a brave fight for life Doctor Procter passed away on August 20th. The *Journal* desires to express its sympathy with the bereaved family. A more extended notice will appear next month. A.G.N.

Errata

We regret that certain errors have appeared in the reviews of two books which are to be found on page 116 of the July issue of the *Journal*. Under the heading "Intercortical Systems of the Human Cerebrum", by Joshua Rosett, Columbia University Press, New York, the last line of the review as it appears in the left hand column should be completed by the addition of the following—" . . . any of the investigators of that subject. The final chapter is principally a discussion of the general pattern of the subcortical pathways of the fissures, and an hypothesis is propounded with regard to the . . ." In the review of "Chances of Morbid Inheritance", edited by C. P. Blacker, H. K. Lewis, London, lines 8, 9, 10 and 11 should be deleted. A corrected version of the review of the former book will appear in the *Journal* forthwith. A.G.N.

Special Articles

THE SEARCH FOR HEART REMEDIES

BY EDWARD PODOLSKY, M.D.,

Brooklyn, N.Y.

The earliest heart remedy of which we have any record is the sea onion or squill. It was first mentioned six hundred years before Christ, in that treasury of old Egyptian medical lore, the Ebers Papyrus. It was so highly esteemed among the ancient Egyptians that it received the symbolic designation of the "Eye of Typhon". It was their great heart remedy. The great Hippocrates learned about it from the Egyptians, and made use of it both externally and internally for various conditions. Pythagoras was acquainted with and wrote a treatise on it, and Pliny described a method of preparing vinegar of squill and the honey of squill for use in dropsy. It early won the enthusiastic support of the physicians of those early days. Dioscorides, the father of pharmacy, Galen and Celsus, the foremost Roman physicians of all times, Theophrastus, the great medical reformer of the Middle Ages, all recommended it in the treatment of heart affections. Strangely, with the passing of years, squill fell into disuse. After remaining in comparative oblivion for several hundred years it was rediscovered by G. van Swieten. Inspired by the work of van Swieten, Altorfi in 1715, and Duisberg in 1740, took as their thesis for the doctorate in medicine the curative virtues of squill. In 1772, Home, for the first time, made experimental studies on the effect of this remedy on the heart. In 1866 Fagg and Stevenson made an elaborate series of studies of its effects on the hearts of animals. Husemann in 1875 showed that the active principles contained in squill produced in general the same effects on the heart and circulation as did digitalis.

The search for active principles had begun in 1812, with Vogel, who isolated "seillitine"; this was also later confirmed by Tilloy, Landerer and Mandet. In 1831 Thomson isolated a substance from the bulb which he called "seillitite", but this was proved to be a chemically impure substance. Merek in 1879 discovered three glucosides, "seilliprieine", "seillin" and "seillitoxin". A year later Jarmersted discovered "seillaine". In 1921 Stoll and Suter isolated a crystalline body which they called "seillarene" and which at the present time is regarded as the least toxic and most active of the principles.

At present squill is a valuable heart remedy in the armamentarium of the cardiologist. Its

effects are in many ways similar to those of digitalis. It has, however, an independent place in heart therapy. It is especially efficient in very slight cardiac insufficiency still refractory to digitalis; in severe cases, as a temporary substitute for digitalis; and in cases which for some reason no longer respond to digitalis. Finally, there are patients who to begin with respond poorly to digitalis and very well to squill. So far the results show that squill may be used with confidence in heart insufficiency.

The greatest heart remedy of all is digitalis. No one knows exactly who discovered this drug or when it was first used. As a matter of fact it was first used for other than its cardiotonic properties. Its first use in medicine goes back to the Anglo-Saxon period, where it is mentioned in the "Leechdoms" of the twelfth century. In those days it was called foxglove, which is derived from the Anglo-Saxon "foxesglew", i.e., fox music, an allusion to an ancient musical instrument consisting of bells hung on an arched support. It was mentioned in the "Liber Medicinalis" of Apuleius, and in the "Vocabularium of the Names of the Plants" of the eleventh century, as "foxes glofa", while in a later vocabulary of the thirteenth century it is called "foxesglove". The ancient Welsh "Physicians of Myddvai" made frequent use of foxglove. It appears as an external remedy in a treatise of the year 1250. Fuchsius described it in his "Plantarum Omnium Nomenclatura" in 1541, and gave it its present name of digitalis, in allusion to the German *Fingerhut* (finger-stall), and a year later gave it its present botanical description. He described its flowers as ranging from white to purple, and gave it the name of *Digitalis purpurea*, which it still retains, and which, as is quite obvious, is not a very accurate designation.

In the sixteenth century digitalis passed into the Herbals and was mentioned by Turner, and by Gerard in 1597, who stated: "It doth cut and consume the thicke toughnesse of grosse and slimie flegme and naughtie humours". In 1640, Parkinson observed its value in "extenuating tough flegme or viscid humours troubling the chest", and remarked further that "There are few physicians use it and it is a manner wholly neglected". Ten years later, however, it was included in the London Pharmacopœia, which shows it had found its place in the materia medica of the physicians of that period. Previous to its first inclusion, Lobel mentioned that "The country people of Somersetshire employ a decoction for the cure of fever, but its operation is exceedingly violent".

Digitalis was chiefly employed in the treatment of epilepsy and as an external application for scrofula or the King's Evil as well as for wounds and ulcers of the legs. In a manuscript book of medical recipes written in 1644 the following formula is given for "An Oyntment for King's Evil", "Stamp a peeke of Fox gloves in a stone mortar and add to it a pound of fresh butter and set them on a soft fire for four hours to make the oyntment". Another: "Against ye falling sickness take purple foxgloves, 2 handfulls of the leaves with 4 ouncees of polipodium of the oak. Boil them in beer or ale and drink ye decoction. One that had this disease 26 years so that he fell with it 2 or 3 times in every month was so cured by ye use of this decoction that he had not a fitt for 16 months after." In the eighteenth century the great Dutch physician, Boerhaave considered foxglove to be of a "poisonous nature", and Haller observed that "six or seven spoonfulls of the decoction produced nausea and vomiting".

About the year 1775, in the County of Shropshire, lived an old woman who possessed a remedy remarkable for its power in curing dropsy. Her fame as an expert in curing this particular disorder spread far and wide, for many people had really been benefited. But her remedy, despite the fact that many attempted to learn its nature, she succeeded in keeping a secret. In the same year, a young physician, practising medicine in the Midlands, William Withering by name, was impressed by the fact that this old woman had "sometimes made cures of cases of dropsy after the more regular practitioners had failed". Dr. Withering determined to investigate and found: "The medicine was composed of twenty or more different herbs, but it was not very difficult for one conversant in these subjects to perceive that the active herb could be no other than Foxglove". That very year he began his study of this remarkable plant".

"I soon found the Foxglove to be a very powerful diuretic, and so in the Botanical Arrangements, published in the following spring (1776), I ventured to assert that the Digitalis purpurea merited more attention than modern practice bestowed upon it. . . . The more I saw of the great powers of this plant the more it seemed necessary to bring doses of it to the greatest possible greatest accuracy. . . . In the summer of 1776 I ordered a quantity of the leaves to be dried, and as it became possible to ascertain its doses it was gradually adopted by the medical practitioners in the circle of my acquaintance.

"In February, 1779, my friend, Dr. Stokes, communicated to the Medical Society of Edinburgh the results of my experiments with the Foxglove. At length in the year 1783 it appeared in the new Edinburgh Pharmacopœia, but from which, I am satisfied, it will again be very soon rejected if it should continue to be exhibited in the unrestrained manner in which it has hitherto been used in Edinburgh and in the enormous doses in which it is now directed in London."

In 1785 Withering published his thesis, "An Account of the Foxglove and some of its Medical Uses, with Practical Remarks on Dropsy, and Other Diseases", which ranks with the classics of medical literature. It gave the clinical histories of 163 of his own cases and many "Communications for Correspondents". Complete directions were given for gathering, stripping, drying and powdering the leaves. Regarding dosage he had this to say: "I give to adults one to three grains of the powder twice a day. Sometimes I give the powder alone, sometimes unite with aromatics, and sometimes form it into pills; if a liquid is preferred, I make an infusion. . . . Patients were sometimes ordered to persist until the nausea came on and then to stop. But it soon appeared that the diuretic effect would often take place first, and sometimes be checked when the sickness or a purging intervened. The direction was therefore enlarged thus: "Continue the medicine until the urine flow or sickness or purging takes place." The "Account of the Foxglove" concluded with nine "Inferences", the last three being so remarkable that they are herewith reproduced.

"That the digitalis may be used with advantage in every species of dropsy, except the encysted; that it may be made subservient to the cure of diseases unconnected with dropsy; that it has power over the motion of the heart, to a degree yet unobserved in any other medicine, and that this power may be converted to salutary ends."

Thus digitalis as a heart remedy was given to the world by William Withering. Of its chemical nature nothing was known, but after the eighteenth century chemists began to evince an interest in the nature of this wonderful remedy. Thompson, in his "London Dispensary", 1811, alludes to the fact that Destouches established inorganic compounds of calcium and potassium, while Radig found potassium acetate in the plant. Thompson himself made a personal examination, establishing "a deep green resinous matter, in which its narcotic power resides". Leroyer, of Geneva, afterward gave the names of "digitaline" and "digitalia" to a material made by a circuitous chemical process, in which it is questionable whether the final product had any place in the original drug. Thompson sums it up as an "extractive mixture", adding that "the active principle of digitalis is unknown".

Strange as it may seem, so remarkable a discovery as digitalis failed to gain a firm foothold in the practice of medicine during the early days of its discovery. It was Sir James Mackenzie who in 1905 rediscovered Withering and brought his work before the medical profession and established the correctness of his teachings concerning the administration of digitalis. From now the study of digitalis began in earnest.

In spite of brilliant chemical research the

nature of digitalis remained a mystery. Attempts to determine the therapeutic value of the drug by chemical methods of assay proved disappointing. This led to the introduction of pharmacological estimations, based on the reactions of animals. Among the animals commonly used were the frog and cat. The frog test had for its object the determination of the amount of digitalis which would produce a permanent standstill in the heart's activity in one hour when injected into the ventral lymph sac, from which it is absorbed into the circulation. The frog method never proved very popular, nor was it accurate to any great extent. In 1910 another great name entered into the history of digitalis, when Hatcher introduced the cat method of digitalis standardization. By this means he determined the minimum lethal dose per kilogram of cat when he injected digitalis slowly into the femoral vein. This is the dose per kilogram of cat weight which brings the heart to a standstill. This estimates the action of digitalis directly on the mammalian heart, and is by far the most accurate. At the present time the cat unit is the accepted standard.

The last great name in the history of digitalis is that of Eggleston, who established the scientific dosage of the drug. One of the most important results of Eggleston's work was the demonstration of the necessity for using digitalis according to its activity, as determined by the cat method of Hatcher. Eggleston's study, ten years after Hatcher formulated his cat unit method, also enabled him to determine the amount of digitalis in terms of cat units per pound of body weight required to produce therapeutic and toxic effects. This led to the use of the so-called "Eggleston Body-Weight Method" of administering digitalis, in which the full therapeutic dose is calculated on the basis of one cat unit per ten pounds of body weight. By the Eggleston method, the calculated total amount is given in urgent cases in from 24 to 36 hours. One-third to one-half of the total calculated amount is given for an initial dose, and the remainder is divided into equal amounts and administered at six hour intervals. By this plan overdosage is prevented, as digitalis action becomes evident in six hours.

Another among the notable heart remedies has been strophanthus. However, because of its emetic effect, which is quite marked, and because its action is at times somewhat uncertain, its use has not been very wide. In 1869 Fraser isolated a glucoside which he named "strophanthin". Since then several forms of strophanthin have been recognized: the amorphous strophanthin extracted from *Strophanthus hispidus* and from *Strophanthus kombe*, and the crystallized strophanthin derived from one or other of these plants and also from *Strophanthus gratus*.

Strophanthus was studied anew by Fraenkel in 1906, who described with a great deal of en-

thusiasm the wonderful effects in the treatment of advanced heart failure. His results were confirmed by many investigators, but it was also shown that serious accidents and even sudden death occurred altogether too frequently, especially when the drug was given by the intravenous route. Its use was then abandoned, and many felt, as many still do, that it is a dangerous drug.

Among the cardiologists who did not lose faith in strophanthus was Vaquez, who was so impressed with the good results obtained from its use that he determined to investigate the reasons for its toxic action and to find a substance which would retain the undoubted high therapeutic value without the dangers demonstrated to exist in the strophanthins in general use at that time. He soon learned that the way in which strophanthin was prepared had a great deal to do with its toxicity, as well as the substance from which it came, and also that preparations were not constant either in activity or toxicity.

In 1882, Arnaud, professor of chemistry at the Natural History Museum in Paris, succeeded in isolating the active principle of *Acokanthera ouabaio*, a tree, the wood and especially the roots of which yielded an extract. This extract was made use of by the Pahouids and Somalis to poison their arrows. This active principle proved to be a glucoside. Vaquez immediately became interested in this new glucoside, and declared that this was the remedy which he sought. He found upon subsequent investigation that it possessed all of the advantages of strophanthin with none of its dangers. Arnaud, meanwhile continued his investigations, and, in the course of his researches bearing on the different kinds of strophanthins and the active principles contained therein, satisfied himself of the chemical and physical identity of the crystalline principle obtained from *Strophanthus glabra*, of Gaboon, and the one he had previously extracted from ouabaio wood. For this reason he gave the name "ouabain" to the crystalline glucoside obtained from *Strophanthus glabra*, of Gaboon, hoping in this way to distinguish it from strophanthus.

Oubain fulfills at the present time a very important place in the treatment of heart disease. It is used with good results in acute dilatation of the heart; it is a remedy of emergency in advanced cases of heart failure, where in many instances an intravenous injection has proved a life-saver. Its most pronounced effect is on the tone of the heart, and for this reason it is superior to digitalis in defects of the heart muscle.

Quinine, "the heart opium" as a German has fancifully named it, has been used for many years for its sedative action on the heart. It is thought that Skoda first recommended its use in heart disease. Its introduction into the treatment of disturbed heart rhythm dates back from

1914, when Wenkebach described its administration to a Dutch merchant suffering from this form of heart trouble. This man, living in, and acclimated to, the Dutch colonies, was accustomed to take quinine for malaria and other ills and found, curiously enough, that it also controlled his periodic heart attacks. This wonderful property of quinine in regulating deranged heart rhythm attracted a great deal of attention from physicians, and they tried it in many cases with good results. In 1918 Frey proposed the use of the dextro-rotary isomer of quinine, quinidine, in the form of its sulphate salt, instead of quinine itself. And quinidine sulphate came into the therapy of heart disease as the greatest regulator of abnormal heart rhythm we have ever known. It is at the present time, next to digitalis, the most valuable of our heart remedies.

The alkaloid quinidine was first isolated by Heijningen in 1849 from a substance called "chiuoidin", a by-product in the preparation of quinine. He described it under the name of beta-chinin. In 1853 Pasteur prepared the same drug, perhaps in a somewhat purer form, and named it "chiuidine". Hesse, in 1868, in referring to it, called it "conchivine". Quinidine was first used in malaria, and in the present century found its true place in the field of heart remedies. According to Sir Thomas Lewis, quinidine sulphate has the following specific effects on the heart: (1) it decreases the rate of the heart beat; (2) it stops abnormal heart rate and rhythm and brings about a return to the normal rhythm.

Among other heart remedies which have served usefully in time past and at present are *Cactus grandiflorus* and *Crataegus*. *Cactus grandiflorus* has been in use by the natives of Jamaica for many years as a remedy for difficult breathing, an outstanding symptom in heart failure. In Mexico it has been a favourite cardiac tonic. It received a thorough study at the hands of Dr. Scheele, a German physician, who was loud in its praise as a heart remedy, but it passed unnoticed for many years until Dr. Rubini, of Naples, wrote much concerning its virtues, and definitely placed it at the disposal of cardiologists, who use it now at times in cases of cardiac irritability. A well known physician, the late Dr. Green, of Ennis, Ireland, attained an extended reputation for the treatment of heart disorders. He was in possession of a remedy which he kept a secret, much in the same fashion as the old woman of Shropshire. Upon Dr. Green's death in 1894, his daughter revealed the fact that his famous heart remedy was a tincture of the ripe berries of *Crataegus oxyacanthus*. The first conspicuous American reference to *Crataegus* was in an article by Dr. J. G. Jennings, of Chicago, in 1896. From that time interest in this drug developed and physicians made many clinical tests

with it. It has been used with benefit in angina pectoris, cardiac hypertrophy, and mitral regurgitation. It is one of the minor heart remedies of note.

Ever since digitalis was discovered physicians had been on the outlook for other remedies with a possible digitalis action. Some have been discovered, but their action is not quite so marked as that of digitalis. Nevertheless, they have quite an important place in cardiotherapeutics. Quite a few cases which are refractory to digitalis have been found to yield to other drugs, among which is *Apocynum cannabinum*, or Canadian hemp. This plant has been used medicinally in this country for about a century, having been introduced to the profession by Knapp in 1826. He reported 19 cases in which the extract of the plant had been given to provoke vomiting, diarrhoea or sweating, with apparently a high degree of success. Knapp first recorded its action on the pulse: having taken a dose of 30 grains of the extract he noted that his pulse fell from 70 to 50 in one hour, and to 45 in two hours.

In 1904 Wood conducted a study of *Apocynum* on animals which showed the drug to exert a stimulating power on the cardio-inhibitory fibres and cause constriction of the blood vessels. In 1910, Dale and Laidlow isolated a crystalline active principle, "Cymarin", with which they conducted careful experiments on warm-blooded animals. They came to the conclusion that cymarin has an action which is like that of digitalis in all its respects, but is not cumulative. *Apocynum* itself brings about a quick reduction in the apex rate of the heart, a diminution of the pulse deficit, increased urinary output in all cases of oedema, and a simultaneous improvement in the general condition of the patient. But because it produces intense nausea and vomiting it has not been much used.

Another digitalis-like drug is *Convallaria majalis*, or lily-of-the-valley. This remedy has been known in medicine for several hundred years. Laigre, in 1903, refers to its use as early as 1580 by a French physician who wrote concerning it: "The Germans use it much to fortify the heart, the brain and other noble organs. They employ it also in palpitation". In 1770 the stimulating, diuretic and calming virtues of the plant in asthma and in cardiac trouble were recognized by Ferrein. Since 1880 a great majority of all articles concerning the therapeutic use of lily-of-the-valley have emphasized its truly remarkable diuretic properties, and at least one writer has pleaded for its universal adoption under the attractive caption: "Convallaria, the vegetable trocar". Two glucosides have been isolated, "convallarin" and "convallamarin". Used in heart disease the plant causes a lowering of the apex beat, an increased flow of urine, and a decrease

in such symptoms as dyspnoea, headache and other annoyances due to deficient heart action. Its action is in many respects like that of digitalis, but not so lasting. Due to the fact that it induces nausea and vomiting so readily it has not attained great prominence as a heart remedy.

Even in primitive times man seemed to realize subconsciously that a diseased tissue was often capable of furnishing its own medicine. The best results, nowadays, have been obtained in glandular deficiencies, such as that of the thyroid. Insulin, an extract from the islands of Langerhans of the pancreas, has proved, as the whole world knows, a life-saver to many diabetics. There is hardly a tissue in the human body from which an extract has not been made. The search for the hormone or hormone-like body is a magical one, and one of the most interesting attempts within recent times has established that there is a hormone capable of stimulating rhythmic contractions of the heart.

The theory that a specific hormone is elaborated for the regulation of the heart contractions was chiefly put forth by Haberlandt, a German physiologist, who in 1924 stated that he had succeeded in demonstrating a control substance formed in the sinus, a specialized bit of tissue, of the frog's heart and capable of strengthening and accelerating, on the one hand, the automatic impulse of the isolated ventricle, and, on the other, of bringing the resting heart cavity to automatic activity. He referred to this substance as the sinus hormone and demonstrated it as follows. The pulsating and bleeding sinus is plunged into a small quantity of Ringer's solution, and the upper opening of the severed ventricle is at the same time connected with a cannula. This increases the strength of the pulsation and its activity and rapidity. Ringer's solution not so passed through the heart chamber fails to give this result.

With a hormone product manufactured from beef hearts, which he later called a heart-hormone, Haberlandt undertook experiments on the frog's heart. The preparation was tested on 36 frogs' hearts, in dilutions of 1-1,000, 1-1,500, and 1-100 with Ringer's solution. With 0.5 c.c. of these dilutions the exciting, accelerating and rhythm-producing effects on the heart could be demonstrated. The pulse-exciting effects appeared in 17 experiments and the pulse-accelerating in 26, in 7 of which the automatically pulsating ventricles were first influenced chronotropically, and later in the experiment the ventricle which ceased beating was stimulated to renewed action. Such results were also recorded in 7 experiments after removal of the ventricle for a period of one day and in 3 experiments after two days' removal. It was also shown that the heart-hormone in dilutions

of 1-1,000 sensitizes the frog's heart ventricle to adrenalin. Haberlandt's experiments, though not very conclusive, were highly stimulating. His work did not show that the stimulating substance was specific. Later experiments revealed other interesting facts in regard to this.

Two other physiologists, Rigler and Singer, undertook to repeat his experiments. They succeeded in demonstrating a stimulating action on the isolated heart. They also showed that the heart muscle itself was capable of furnishing a substance which would stimulate the heart to activity. They came to the conclusion, after quite an exhaustive piece of research, that heart-stimulating substances were found not only in the various parts of the heart itself but even in organs like the spleen and liver, as well as in the lungs. These organs, when mashed up in water or in alcohol, and the heart-stimulating substance removed, had two important properties—inotropic, affecting the force or energy of the heart, and chronotropic, affecting the rhythm of the heart.

Still another German physiologist, continuing with this interesting bit of work, took various parts of the heart itself, also bits of muscle from the thigh, the intestines, stomach, and brain, and made extracts of them. These were ground to pulp with a small quantity of Locke's fluid and clean sea-sand. The mixture was extracted for about eighteen hours. Other extracts were made, using alcohol instead of Locke's solution. These were found to be effective as Haberlandt's in starting heart action. Evidently they contained a hormone, which when injected into the blood stream had a specific action on the heart in causing it to beat at a more rapid rate and with greater force.

Haberlandt was firmly convinced, as were other investigators, that the human body is capable of furnishing a definite medicine for the ailing heart, and that this was a definite substance or entity. He endeavoured to learn something regarding its physico-chemical nature. He found that the hormone remained efficacious for a long time, though in somewhat weakened measure. He also found that it was not a lipid or fatty body. It proved to be very slowly soluble in chloroform. It could also pass quite easily through a membrane, and therefore was not of high molecular composition. It resisted heat, and this is characteristic of hormones.

He also found that his heart hormone exerted analogous, though not identical, actions on the heart as did adrenalin; while adrenalin has a constrictor action, the hormone has a vasodilating action. It was his belief also that the heart-hormone will make it possible to understand cardiac activity more thoroughly. More important still is that the heart-hormone could be used for clinical purposes, which is the ulti-

mate aim of all laboratory experiments performed by the medical scientist.

Within the last year or so French physiologists have prepared an extract from the pancreas of the ox which they have termed "angioxyl". It has been used with particularly good success in angina pectoris. This preparation acts on the pain and helps to abolish this troublesome symptom, much to the gratification of the patient. In high blood pressure the pressure is reduced and the general condition of the patient is much improved.

The magical search for heart medicines which has been going on for so many years has borne much fruit. But there is still much to accomplish. Degenerative heart disease is still leading as the chief taker of human life, and against this form of heart disorder little can be accomplished, but now one hears something about the influence of certain vitamins on heart deficiencies. Into this interesting domain the search now leads, and what we will find here only the future can say. But the search no doubt will be an interesting one.

Medical Economics

ALBERTA NOTES

The Council of the College of Physicians and Surgeons of Alberta recently held a meeting in Calgary, to which were invited representatives of the different organized medical societies throughout the province. Preliminary meetings had been held by these societies during the month of July, to discuss the subjects of: (1) health insurance under the direction of the Provincial Government; (2) revision of the schedule of fees; (3) general revision of the Workmen's Compensation Board fees; (4) percentage of normal fees to be charged in municipalities for indigent work. The results of the deliberations of the societies regarding these questions were brought forward at the meeting of the Council. It was agreed that any financial arrangement between physicians and the health unit, where the health insurance scheme is being put into operation, should be backed by the Provincial Government, and should be for a stated period. It was felt that it would be most unsatisfactory to test the scheme out after having established a health unit and having agreed with the profession as to the percentage of normal fees to be paid, as all expenses would have to be paid, for the local unit district might be unable to carry out its part owing to the small amount of taxes paid, on account of general crop conditions or other factors. No health insurance scheme would be successful unless there was proper medical representation on the board which inaugurated or put the plan into effect.

It is noted that the Provincial Government was contemplating to utilize two areas for testing out the plan, but it was felt that it should

be province-wide and that it should be compulsory when put into operation. The Council endorsed the idea that there should be a free choice of physicians and that each physician should have a free choice of location and be remunerated on the basis of services rendered. It was felt that no cash benefits or compensation for loss of time through illness should be incorporated in the scheme. One point which was stressed was that whatever scheme was adopted should before adoption, be found actuarially sound. Regarding the question of fees for work done under the Workmen's Compensation Board for 1935, this subject should be considered later. A committee was appointed to investigate the question of indigent sick work and ascertain the percentage of the physicians' work, which was for the care of indigents, so that they could arrive at some fair basis of fees which might be requested from a municipality.

The Council expressed the view to the Provincial Government, some time ago, that there is a necessity of having some fund from which to pay for hospitalization and first aid medical care for persons injured in motor accidents. It was noted at the recent meeting that Great Britain has passed a law for similar purpose and gives a physician twelve shillings and six pence a mile for all distance travelled by him beyond two miles. The Council felt that it was absurd to have hospitals and physicians carry the burden any longer, as there are about one hundred thousand drivers' licenses in this province. If the fee were made an annual one it might create a fund to meet the requirements of the suggested fund.

G. E. LEARMONTH

Notes on the British Pharmacopœia and Canadian Formulary

For the Ophthalmologist

A new class of preparations have been included in the British Pharmacopœia, which are intended to replace some of the ointments often used for application to the conjunctiva. These might well be tried by ophthalmologists, as they are said to be very superior to the old preparations. The chief difference is due to the character of the base. The old atropine, cocaine and iodoform ointments were made with lard, which did not keep well and readily became rancid, and this tendency was increased by the addition of oleic acid in the case of the two alkaloids. The oleic acid was used in order to make the alkaloid readily soluble in the lard.

The new base consists of 10 per cent of wool fat and 90 per cent of soft yellow paraffin. This, like the soft paraffin alone, which was often used in this country, will keep well and can readily be forced out of ointment tubes. The alkaloids are used in the form of their salts, and are dissolved in minute amounts of water before incorporating them with the base. Owing to the presence of the wool fat, the small amount of water will be readily taken up. The alkaloid, being in the form of the salt, is not soluble in the paraffin and will consequently readily dissolve out in the tears. It should be more readily available than the alkaloid in the old ointments, which was soluble in the base used. In part, this accounts for the lower concentration employed. These eye ointments (Oculenta) should be sterile, if prepared according to instructions. The list of Oculenta with their strength is as follows:—

- Oculentum Atropinæ: Atropine Sulphate, 0.25 per cent.
- Oculentum Atropinæ cum Hydrargyri Oxido: Atropine Sulphate, 0.125 per cent, Yellow Mercuric Oxide, 1 per cent.
- Oculentum Cocainæ: Cocaine Hydrochloride, 0.25 per cent.
- Oculentum Hydrargyri Oxidi: Yellow Mercuric Oxide, 1 per cent.
- Oculentum Hyoscinæ: Hyoscyne Hydrobromide, 0.125 per cent.
- Oculentum Iodoformi: Iodoform, 4 per cent.
- Oculentum Physostigminæ: Physostigmine Salicylate, 0.125 per cent.

Yellow Mercuric Oxide Ointment, which was deleted from the British Pharmacopœia, is retained and available through the Canadian Formulary. It is to be noted that there are two Oculenta which were not paralleled amongst

the British Pharmacopœia ointments, namely those of Hyoscyne and Physostigmine. Hyoscyne has the same action as atropine.

Fluorescein Solubile.—Soluble Fluorescein is made available in the British Pharmacopœia, 1932, and if this preparation is prescribed a fluorescein of high quality should be obtained. The commercial preparations vary considerably in quality.

The Biologically Standardized Galenicals

Digitalis.—The National Department of Health has made great strides in their endeavour to provide for physicians and patients in Canada digitalis in powder form and in tincture of a standardized and uniform type. Indeed, the necessary preliminary research work carried out in this field by C. W. Chapman and C. A. Morrell has attained deserved recognition by all those engaged in this problem. In the near future the preparations of all firms, as is now the case for the more important distributors, will be found to be satisfactory. The requirements in Canada should, indeed, yield more uniform products than even those of the Pharmacopœia. Both definitions require the alcoholic strength to be 70 per cent, and physicians should realize that the incorporation of tincture of digitalis in mixtures is inadvisable, since the dilution of the tincture, and particularly the presence of salts, acids and alkalies, leads to rapid loss in therapeutic strength. The safest and best flavour for Tincture of Digitalis is cinnamon, as contained in the Canadian Formulary as *Tinctura Digitalis Composita*. Even this should be freshly prepared.

The above remarks apply to Tincture of *Strophanthus*, though this is rarely used in Canada. The Canadian regulations require it to contain not less than 88 per cent alcohol; the British Pharmacopœia, not more than 70 per cent.

Liquid Extract of Ergot.—At the present moment, there is some doubt in regard to the therapeutically active principle contained in ergot, and while both Canadian and British authorities require a method of standardization which will disclose the amount of the alkaloids, ergotoxine or ergotamine, and should result in similar preparations, it remains for the future to disclose whether this method is the best test. Further, as judged by this standard, liquid preparations deteriorate rapidly, and the powdered ergot of the British Pharmacopœia appears to be the best preparation to produce definite results.

The Biological Products of the British Pharmacopœia

We have already encountered a misconception in regard to the biological products mentioned in the British Pharmacopœia, namely, that the British Pharmacopœia description is binding in Canada. This the Canadian Formulary has already shown is not true.

The British Pharmacopœia defines Vaccine Lymph (smallpox) and Antityphoid Paratyphoid (T.A.B.) in accord with the Therapeutic Substances Act of Great Britain. In Canada, under the Food and Drugs Act and its Regulations, the first is closely defined and must be adequately tested for activity and for the presence of other organisms. In Canada, the limit for viable non-pathogenic organism is one-half that of the British Pharmacopœia. Other vaccines are not specifically defined in Canada, but are covered by rigorous regulations.

The British Pharmacopœia defines Diphtheria, Tetanus and Gas-gangrene Antitoxins and Antidysentery Serum. The first two are covered by specific regulations in Canada, while the others are covered by a general one. The Canadian regulations require not less than 350 units of diphtheria antitoxin per millilitre, the British not less than 400. In solid preparations, both require 4,000 units per gram. Again, in the case of Tetanus Antitoxin, a difference in strength is found. Nor are the definitions for Diphtheria Toxin or Toxoid and for Schiek testing and Schiek control identical in the two sources.

While the name adrenaline has long been included in the British Pharmacopœia, and may be freely used as a designation for this active principle in Great Britain, in Canada it is not clear as to whether this name is still a perquisite of a certain pharmaceutical house. Consequently, the word "Epinephrine" is preferred by the authorities at Ottawa, as it is in the United States, where in all medical and scientific literature the word is employed. It would be well were this example followed in Canada.

Pituitary Extract (posterior lobe).—Both authorities agree that the dose should always be expressed in International Units, and in Great Britain 10 units must be present in one c.c. This is not required in Canada, but is usually the case.

Thyroid.—The manner in which dried thyroid should be defined and standardized has not yet been finally settled, and the definitions in Canada and in the British Pharmacopœia differ considerably. Whether the therapeutic effects of the preparations conforming to the Canadian and British regulations are the same has not been determined, but there seems reason to believe that thyroid as defined in Canada is more potent than that of the British Pharmacopœia.

V.E.H. AND G.H.W.L.

Association Notes

The Calgary Meeting: Proceedings of the Sections and General Sessions

The scientific program began at 9.15 a.m. on Wednesday, June 20th and was concluded on the afternoon of Friday, June 22nd. The Sections of Medicine, Surgery, Urology, Eye, Ear, Nose and Throat, Radiology, and Public Health met in the mornings. The Section of Military Medicine held a luncheon meeting on Thursday, June 21st, at the Palliser Hotel, when the medical officers who had seen overseas service were the guests of Dr. J. N. Gunn, D.S.O. On this occasion two addresses were delivered, one by Col. F. C. Bell, C.M.G., M.D., of Vancouver, on "A Special Reserve of Officers for the Canadian Army Medical Corps", and the other by Major F. C. Clarke, M.C., M.D., of Calgary, on "A Glimpse of the Past: What of the Future". The General Sessions were held in the afternoons.

Most, if not all, of the papers presented will be published in the official *Journal* of the Association during the next few months. In the meantime we are offering to our readers in this Section abstracts of such papers as have been available to us. This is an innovation which, it is hoped, will prove helpful and attractive. In the future this feature will be made more complete, and, to this end, it may be remarked, the work of the *Journal* would be greatly facilitated if those presenting papers at the Annual Meeting would be careful to prepare brief summaries dealing with the more important of their remarks and send them on to the Editor. It should be possible, then to present a complete record. This suggestion is put forth with the idea of making the *Journal* still more efficient in detailing the news of our Association. The papers abstracted below were read on June 20th and the morning of June 21st.

"Some Simple Observations and Procedures of Assistance to the General Practitioner on the Diagnosis and Eradication of Tuberculosis", was the title of a paper presented by Dr. R. G. Ferguson, of the Saskatchewan Anti-Tuberculosis League, in the Section of Medicine.

"By early diagnosis, the segregation of active cases, and the examination and early treatment of those contacts infected by these 'spreaders', tuberculosis can be controlled and the disease gradually reduced to a minor cause of death in any community.

"The sick and spreaders should be removed to a sanatorium where all facilities are available for the most specialized treatment, and where they will receive a thorough education regarding their personal habits and the technique necessary to prevent the spread of the disease.

"In the agricultural Province of Saskatchewan the fatal age period of tuberculosis reaches its maximum mortality between 28 and 30 years. The age maximum break-down from this disease in Western Canada is between 18 and 24 years. In Saskatchewan at the present

time we find that although the Indians constitute less than 2 per cent of the population they account for roughly 25 per cent of the deaths from tuberculosis. There are certain predisposing occupational hazards. The more serious of these are the dusty industrial occupations, and by far the most important among these is quartz mining of any type, where silica dust is present, especially quartz gold-mining.

"In this and in every other country the high incidence of tuberculosis among nurses is probably entirely due to infection. In 1933, 5 per cent of all patients under treatment in the sanatoria of Saskatchewan were nurses or nurses-in-training.

"Extensive examinations of family contacts in recent surveys, both in Europe and in America, have shown that the incidence of positive reactors to tuberculosis is usually two or three times as high among family contacts as it is among the average children of the community. In practice it works out that where a death occurs there are just over eight contacts requiring investigation. Since observation is required at least annually for a period of three or four years, the average family physician, after a period of five years, would have an average of forty contacts under observation."

Dr. Ferguson urged examination of the sputum of all those, young or old, who have a chronic cough. He stated that "pain in the chest has emerged as the symptom of greatest importance as an indicator of pulmonary tuberculosis."

Dr. Harold Orr, Edmonton, read a paper on "The Reactions Attending the Intravenous Use of the Arsphenamines". This is of great importance to the practitioner of medicine, because these drugs, which contain arsenic, are widely employed in the treatment of disease, notably syphilis. The administration of the arsphenamines is followed in some instances by a reaction which may endanger the life of the patient. Dr. Orr stated that "the causes of the reactions are probably as diverse as are the reactions themselves, and, though not yet fully understood, some degree of clarity is gradually emerging as a result of much intensive study by numerous investigators." He discussed the various types of reaction which may occur, and pointed out the precautions which the attending physician should take in order to prevent the appearance of an unfavourable reaction or to minimize the danger, should it appear.

Dr. W. P. Tew, of London, Ont., delivered a paper which dealt with "Recent Advances in Obstetrics and Gynaecology". In his discussion of recent advances in obstetrical practice he considered these as being of three classes: (1) those associated with pregnancy; (2) those associated with delivery of the child; and (3) those relating to the period following child-birth. The most notable recent advance first is the increasing advantage that is being taken of opportunities for pre-natal care. The regular visits made by the pregnant woman to her physician, which it is desirable to commence as early as the second month of pregnancy, give full scope for the application of preventive measures. Pre-natal care permits the physician to maintain the health of his patient through the correction of remediable physical defects, through supervision of the diet, and by the treatment of those complications which so frequently accompany the course of pregnancy. It also greatly aids the birth of a healthy child, by allowing the physician to discover at an early period those conditions which make for a difficult delivery. The recent advances associated with the birth of the child have to do with the relief of the pains of labour by the use of suitable drugs; improvements in the methods of delivery and resuscitation of the new-born child, when necessary, through use of a mixture of carbon dioxide and oxygen by means of the insufflator. The recent advances associated with the period following the birth of the child are concerned with nursing difficulties, in remedying which a high protein diet has been found of value, and in the ap-

plication of prophylactic measures against puerperal sepsis. Dr. Tew then considered recent gynaecological advances. He mentioned the progress that has been made in the treatment of menstrual disturbances, prolapse of the uterus, and cancer of the cervix. In connection with the latter, he stressed the necessity for early diagnosis if the hope for a cure is to be held out to the patient.

Dr. Wesley Bourne, Montreal, then read a paper entitled "An Estimate of the Usefulness of Some of the Newer Anaesthetics in Practice". This paper can be found in the July issue of the *Journal*, p. 44.

Drs. D. S. Macnab and E. P. Scarlett, of the Calgary Associate Clinic, in the Section of Surgery, presented a paper on "The Value of Glucose in Surgical and Medical Conditions and its Mode of Administration".

The remarkable therapeutic value of glucose in hepatic and gall bladder disease has prompted a review of certain aspects of its use in surgical and medical conditions.

In operative surgery it is important to maintain at all times an optimal glucose reserve. Pre-operatively, in most cases, this may be achieved by the oral administration of easily assimilable sugars. The use of glucose by hypodermoclysis is unsatisfactory. The ease and value of glucose administration by a vein is facilitated by the use of the continuous intravenous infusion, or so-called "continuous drip" method. The practice of giving glucose by proctoclysis was examined in detail, and the literature reviewed in this connection. The results of experiments dealing with the problem were presented. The authors concluded that glucose when given by rectal drip or massive rectal infusion in any concentration is of no value, and that its presence in the rectal solution retards the rate of water absorption.

The importance of glucose as a source of readily available energy to the heart and its value in the handling of cardiac conditions was discussed.

Finally, the value of the administration of glucose in the surgical treatment of acute abdominal conditions, and particularly in gastric surgery is emphasized. In surgery of the biliary tract it was essential that, pre-operatively, the patient receive large amounts of glucose, so that glycogen storage is secured and adequate functioning of the liver will result. Observations were set forth showing that such a procedure makes for an improved post-operative course.

Dr. Frederick W. Marlow, of Toronto, speaking on the subject of "Unusual Bleeding in Middle and Later Life", said:—"As to the necessity for a careful physical examination in cases of unusual bleeding it need only be said that any woman who does not seek to learn the cause and obtain professional advice is, notwithstanding her religious or other beliefs, a potential suicide, and that any physician, general or special, who belittles the importance of her complaint when he is consulted, or fails to make a thorough examination or advise her to consult someone who will, is a potential murderer.

"Unusual bleeding is the most outstanding feature of female pelvic disease, and often the longest neglected". Dr. Marlow went on to point out how intricate is the work of the glands of internal secretion. He likened these different organs to members of a political cabinet, each in charge of a particular service; for example, the pancreas might be designated as Minister of Fuel, Internal Combustion and Energy. Because of the interrelationship of these glands it was difficult to single out any one as responsible for menstruation. According to the speaker, "little heed has been given to what in our opinion is the most important agent in control, that is, the uterine miracle".

Dr. Marlow emphasized that there is no disease in which early recognition is more important than in cancer, and in this connection he pointed out that as unusual

bleeding is a symptom of cancer, therefore, in a case of unusual bleeding it behooves us to have in mind the possibility of cancer until a definite diagnosis is made, and that delay in establishing such may be dangerous.

Dr. F. P. Patterson, Vancouver, delivered a paper on "Acute Infective Osteomyelitis". This condition may be defined as an acute infection of a bone or bones of the body, with the production of pus. It is particularly a disease of childhood or growing adolescence. It is most serious, and if not recognized at an early stage, or if adequate treatment is not instituted, there is grave danger of fatal termination or of crippling deformities and permanent disability.

The x-ray will give a negative picture in this condition until the disease is well advanced, and it is thus necessary, as Dr. Patterson emphasized, for the physician to employ his trained clinical senses rather than depend upon laboratory aids in making his diagnosis. He stated that there is often delay in making the diagnosis because the patient does not call his physician at an early stage in the disease. It is important that parents realize that when a child has a temperature, and there is pain or tenderness in a bone near a joint, examination by the doctor is imperative. The disease often occurs in vigorous healthy children because injury sustained at play is, in many cases, the initial factor in the condition. A parent should not attempt to diagnose any such pain as rheumatism or neuritis, and should realize that the condition demands the most careful scrutiny of his doctor. Those bone infections which arise near the hip are of particular importance, because the anatomical structure in this region is such that early involvement of the hip-joint often occurs.

Dr. Patterson said that "effective treatment implies not only conservation of the life of the patient but preservation of the normal function of the limb". The treatment consists in the exposure and removal of the infected portion of the bone by surgical treatment in order that the infection may be drained and the bone given a chance to fight the infection successfully, and to produce new bone to replace that portion which has been destroyed. Dr. Patterson had found in his experience that the use of large bone grafts is a most desirable practice when the disease process has resulted in a great destruction of bone which leaves a cavity that is a source of weakness. When treatment is given early in the course of the disease the chances for a satisfactory recovery are very good. A delay in securing treatment enlarges the field of the operation, and the chance of a nearly complete return to normal is much reduced.

Dr. P. H. T. Thorlakson, Winnipeg, spoke on the subject of "Common Bile Duct Obstruction". The purpose of this paper was to show by x-rays the changes which take place in the bile ducts as the result of varying degrees of obstruction in the common duct. Five cases were quoted as the basis of the report made.

In the General Session, on the afternoon of June 20th, Sir Frederick G. Banting, of the Department of Medical Research, Banting Institute, University of Toronto, spoke on "Resistance to Experimental Tumour".

Cancer research may be said to have originated in 1889, when success attended the attempt to transplant cancer from one rat into other rats. Cancer is not a disease limited to human beings; it is found in all species of vertebrate animals. Tumours in animals may be divided into two classes—those that tend to regress and those that do not. Apparently, certain animals have a higher individual resistance to tumours than have others.

A large number of workers have used various means in an attempt to raise resistance in animals. Sir Frederick described the work he himself had conducted, stating that as a result of his experiments

certain general conclusions had been drawn. He summed up with the statement that: "At present, there is a chaos of experimental evidence with regard to the tumour problem. One must keep an open mind, in order not to confuse facts with theories. As the fundamental principles of tumour growths are the same in animals as in man, it is hoped that through animal experimentation, future research workers will provide a solution of the problem and a specific treatment for human cancer".

Prof. J. C. Meakins, Physician-in-Chief, Department of Medicine and Director of the University Clinic of the Royal Victoria Hospital, Montreal, delivered a paper on the subject of "Amœbic Dysentery in the Montreal District in 1932-34".

Dr. Meakins became interested, in the autumn of 1932, in the possibility of cases of ulcerative colitis, inflammation and ulceration of the large bowel, being due to amœbic infestation. It is the invasion of the gastrointestinal tract by the organism known as *Entamoeba histolytica* which is the cause of the condition known as amœbic dysentery. This association was established for Montreal during the winter of 1932-33. In May, 1933, a systematic examination for intestinal parasites of patients admitted to the public wards of the Royal Victoria Hospital was begun, and Dr. Meakins' paper is based on the results of this work.

Forty-two cases of amœbic dysentery were discovered in 294 patients examined, and this gives a percentage of population examined of 14.3. Age and sex do not appear to affect the appearance of this disease, because the sufferers ranged from 6 months to 68 years of age, and the disease was almost equally divided between males and females. Dr. Meakins established an interesting point in that it was determined, in at least 36 of the cases that the disease must have been contracted in Canada and not in some foreign country. The present infestation is not really epidemic, but is rather endemic. That this is not a new disease to this continent is demonstrated by reference to the case-histories of proved cases of this disease during the past forty years. It is difficult to make statistical comparisons as to the frequency of this disease at the present time as compared with a number of years ago, because the condition is one which is difficult to diagnose with certainty, and many cases in the past may not have been correctly diagnosed when the present great interest in this condition did not exist.

Dr. Meakins stated that amœbic dysentery appears in three clinical forms. There is the latent case in which the causative organism is present in the gastrointestinal tract, but the patient has not, at any time, had any symptoms referable to the intestinal tract. The chronic form of amœbic dysentery is characterized by a mild and rather indefinite onset of symptoms, and it may persist for a number of years before passing into an acute condition. The acute form is characterized by a sudden and very severe onset, and, if untreated, it may terminate fatally or pass on to a chronic form. In this group of 42 cases investigated, 12 were latent cases, 11 were chronic, and 19 acute. It was found that the mortality rate was 7 per cent, and that 70 per cent of those infected have more or less severe disability. There are a number of preparations used successfully in the treatment of this condition, ipecacuanha and emetine being the best known. The treatment of the condition requires great watchfulness on the part of the attending physician, since the drugs employed may give rise to toxic effects unless most carefully supervised. Dr. Meakins stressed the need for a prolonged course of treatment in this disease in order to effect a complete cure. The reason for this is that relapses frequently occur as a result of incomplete treatment, and if a patient is discharged only apparently cured

specialization in some branch of medicine as conferring on them a higher status, and as being likely to afford them more of the amenities of life than is possible under the existing conditions of general practice. The Scottish Committee expresses the opinion that these auxiliary services should normally be mediated to the patient by the family doctor, and that the prevalent practice of direct approach to specialists by patients, both in hospital and in private practice, is not in the best interests of either party or of health policy generally.

It is recognized that if a high standard of service is to be rendered by the family doctors of the country it is necessary that the conditions under which they work should be favourable. It is stated that in many practices, especially in densely populated districts, the number of daily visits and attendances which have to be made is excessive. This renders it impossible for the practitioners to do all that they could wish for those under their charge. Their work has sometimes to be done under conditions incompatible with the reasonable needs of the practitioner for rest and leisure. Under present conditions however it is the case that many practitioners are only able to make an income sufficient to cover expenses and provide reasonably for their families by having large numbers of persons on their lists. In both these aspects, therefore, the conditions of service and remuneration call for consideration. No service can ultimately be adequate when the work has to be unduly hurried, or where the practitioner is so far fatigued that his interest in the scientific side of medicine ceases to be alert.

R. W. CRAIG.

7 Drumsheugh Gardens,
Edinburgh.

The London Letter

(From our own Correspondent)

A recent statistical analysis of mortality rates at all ages revealed a very striking fact that had not been apparent before, namely, that the improved conditions at the younger ages tend to carry on for that particular generation. This makes the health of the child of even greater importance than the immediate problem of the younger members of the population. From what has been said before in these notes, despite the optimism of the reports of the school medical service, there is a strong feeling that the present period of economic depression is bound to leave a mark upon the children affected by it, even although no immediate effects upon nutrition (which in this connection means weight and height for age) are observed for the country

as a whole. Another aspect of the problem has also been revealed by the statisticians in a paper on overcrowding and health, just published by Dr. Percy Stocks. By a clever method of taking the country zone by zone according to latitude (omitting London) it is shown that the increased mortality risk well known to occur as the analysis moves northwards is associated more directly with overcrowding than with climatic factors. Overcrowding, in the sense of too many persons per room, is more important than the density of houses to the acre. The other factors commonly invoked by those who will not face the facts, such as the poverty of those dwelling in overcrowded conditions or the excuse that less fit families tend to migrate gradually into poor housing conditions, are examined and found to be insufficient to explain the variations in the mortality rates. It is especially among the age-group one to five years that the stress appears to fall, and it is here that respiratory disorders spread by droplet infection because of insufficient air-space for the inhabitants of overcrowded houses take their toll. Statistics are sometimes looked at suspiciously by medical men, but in relation to mortality rates and population problems they represent the only means of approach. At a time when the Government has promised legislation to deal with overcrowding it is particularly fortunate to have the scientific case set out in such an unanswerable manner.

Another example of a high death rate at a special age-period formed a subject for discussion at the recent National Conference on Maternity and Child Welfare held in Birmingham. It was pointed out that although in the past quarter of a century the general infantile mortality rate had fallen by one-half, the rate for the first week had only decreased by one-tenth and for the first four weeks by one-fifth. Such conditions as asphyxia, injury and prematurity appeared to account for two-thirds of these deaths, and it is yet another comment upon the problem of obstetrics whereby the maternal death rate fails to decrease despite great antenatal and other efforts that these immediate neo-natal disasters remain so high. Of those who survive the immediate hours after delivery Prof. Leonard Parsons showed that infection played the dominant part in causing death. The skin and the respiratory tract appear to be the main routes for such infection to gain entrance, modern methods having at any rate greatly abolished the risk of umbilical sepsis. Since the respiratory tract plays such an important part, even at the earliest weeks of life, as a portal of entry of sepsis it is surely a matter for great concern that those attendant upon young infants should consider acute or chronic nasal or bronchial catarrh as of comparatively trifling risk. Prof. Parsons emphasized that it is from such sources that the new-born infant gains its

fatal infection. Prevention of such tragedies would surely be a more effective way of dealing with the problem of neo-natal death than the instruction in birth control which was reported by one subsequent speaker as being among the important agencies for attacking the problem.

The British Medical Association is just concluding its annual meeting at Bournemouth as this letter is being composed. It has been complained of this meeting by the leading daily labour paper that the program contained too much about cocktail parties, manikin parades and other social activities. The volume of work done by the business side of the Association and at the Scientific Sections can safely be left as evidence against the accusation that these annual gatherings are one long riot of dissipation. The question of the recognition of chiropodists was discussed, and the Representative Meeting rejected the Council's advice to accord this form of approval and control. On the subject of abortion, which has been smouldering, so to speak, for some years, a definite decision was reached to set up a special committee to inquire into the medical aspects of this problem. The President's address was a fitting discussion of the influence of climate upon health. In view of the statistical work already mentioned, much of what is said by physicians practising in spas or health resorts has to be taken as somewhat prejudiced. This cannot be said of the Presidential address. The dangers of excessive sunshine were well stressed, and there was a good plea for rest and an adequate fluid intake as contributory factors in the maintenance of health. The whole subject was one which required scientific review and tabulation. The health resorts of this country, it was urged, were in need of necessary reorganization and improvement, much of which could be done by a healthy competition in catering and in the provision of the necessary aids to the care of invalids.

ALAN MONCRIEFF.

121 Harley St.,
London, W.1.

Comply with same humours, bear with others, but serve none. Civil complacency consists with decent honesty: Flattery is a Juggler, and no Kin unto sincerity. But while thou maintainest the plain path, and scornest to flatter others, fall not into self-Adulation, and become not thine own Parasite. Be deaf unto thy self, and be not betrayed at home. Self-credulity, pride, and levity lead unto self-Idolatry. There is no Damocles like unto self-opinion, nor any Siren to our own fawning Conceptions. To magnify our minor things, or hug ourselves in our apparitions; to afford a credulous Ear unto the clawing suggestions of fancy; to pass our days in painted mistakes of our selves; and though we behold our own blood, to think ourselves the sons of Jupiter; are blandishments of self-love, worse than outward delusion.—Sir Thomas Browne.

Letters, Notes and Queries

The Department of Pensions and National Health and the Canadian Medical Association

To the Editor:

On reading over the memorandum and resolution objecting to the transfer of the activities of the "Division of Child Welfare" of the Department of Pensions and National Health to the "Canadian Council on Child and Family Welfare", passed at the annual meeting of the Canadian Medical Association at Calgary in June last, certain errors are noticed and it is felt that the members of the Canadian Medical Association should be fully informed of the reasons for the transfer and that the errors in the memorandum upon which the resolution is based should be pointed out.

It is regretted that the members of the executive council charged with ascertaining the facts and drawing up the resolution did not communicate with an official of the Department of Pensions and National Health before drawing up the memorandum for Council. Had they done so, certain erroneous and misleading statements would have been avoided and the necessity for the resolution might not have been indicated. There are two representatives of the Department on the Council and had they been given the opportunity of reading the memorandum before it was presented to Council they would have been in a position to make considered comments.

The framers of the memorandum have misinterpreted the duties and responsibilities placed upon the Department as outlined in the second paragraph of their memorandum. While it is true that the duty of cooperating with provincial, territorial and other health authorities with a view to conserving child life and promoting child welfare is imposed upon the Department, the method by which this is to be accomplished is not laid down. The establishment or the maintenance of a Child Welfare Division is not compulsory. The law officers of the Crown who have been consulted take this view.

In the third paragraph the following appears: "A Child Welfare Division was created in the Department in 1919. The Canadian Council on Child and Family Welfare was organized in 1922". The impression created here is that the Child Welfare Division of the Department was established two years before the Canadian Council on Child and Family Welfare, and was the parent body. As a matter of fact they were established in the same year. A Dominion Conference on Child Welfare was held in Ottawa on October 19th and 20th of that year (1920), convened by the Dominion Department of

Health, at which the Canadian Council on Child Welfare was created. The Department had agreed to call such a conference to provide for the creation of such a national body on March 23, 1920, a month after the creation of the Departmental Child Welfare Division, and a month before the appointment of its Chief.

The statement in paragraph eight, that: "The only opinions expressed so far, of which we have any knowledge, have been opposed to the action", would not have been made had the matter been discussed with an official of the Department, for there are on the departmental files numerous resolutions of a commendatory nature.

In paragraph nine, by associating the words ("since resigned") with the name of the former secretary, the impression has inadvertently been created that the resignation was made as a protest against the change; whereas, the resignation of this official was made for administrative reasons, and bears no relation to the matter in hand. It might likewise be inferred that the Chairman resigned on account of his disapproval of the new arrangement. Before the change was made he was consulted and expressed his approval, and it is believed that he has not changed his opinion.

Perhaps there is no more erroneous statement contained in the memorandum than that found in the eleventh paragraph, *viz.*, "The Dominion Government has transferred its responsibility for the conservation of child life and the promotion of child welfare . . . from a department under medical administration . . . to an organization under a non-medical director". The administration of the Child Hygiene Division of the Canadian Council on Child and Family Welfare is entrusted in addition to the full-time nursing staff, to three physicians, one of whom is a diplomate in public health, *viz.*, the Chief Executive Officer of the Department of Pensions and National Health, who acts as Chairman of the Advisory Committee; two physicians retained on a part-time basis—one in pædiatrics and the other in obstetrics, and the Director of the Council who is a specialist in welfare work. The latter two physicians have regular office hours, daily, with the Council. This is clearly set forth in the memorandum effecting the transfer. These men with the other full-time staff of this Division of the Council, discuss policy, supervise the production and distribution of publications, and lecture in their respective fields.

That there should have been opposition to the move at the outset was not unexpected, as no opportunity was given the Department to state its case before such opposition was organized. It was feared by those who opposed the plan that it was the intention of the Department to completely withdraw from the field of Child and Maternal Welfare, but when it was ascertained

that the Department had actually strengthened and consolidated its position, opposition was largely withdrawn and resolutions of approval were received.

Before so important a step was taken all angles of the problem were carefully considered, and it is evident that the resolution of the Council of the Canadian Medical Association, made as it was without a full and complete study of all the attendant facts, is not justified. The participation in child welfare now exercised by the Department is technically better, clinically more expert, and the service rendered the public more effectual than heretofore. The change in procedure constitutes true leadership in the public health field, and is being increasingly recognized and accepted as such.

Yours very truly,
R. E. WODEHOUSE,
*Deputy Minister,
Dept. of Pensions &
National Health.*

Ottawa,
August 1, 1934.

Topics of Current Interest

The Sale of Contraceptives

In the House of Lords on February 13th Lord Dawson of Penn moved the second reading of the Contraceptives Bill, which restricts the sale, display, and advertisement of contraceptives. He said opinions on birth control and contraceptives could not be intelligibly considered one without the other. As one who had thought and written about the subject for many years, he wished at once to identify himself with the view that the way to keep the sale and use of contraceptives on sound lines was to remove the veil of doubt as to the honesty of contraception. The fact that there was a doubt as to its cleauliness and honesty prevented honest traders from taking contraceptives into their trades, and thereby the profits remained too large and the sale got into the hands of less scrupulous traders. If this slur were removed that trade would get into more normal channels. No impartial observer of events today could doubt that birth control was here to stay, and was part and pareel of our social fabric. At the same time there was good cause for protecting children and young persons from having contraceptives forced on their notice by automatic machines in streets or by lurid displays in shops. An investigation of the facts—and he had investigated facts—would show that in the main the wholesale trade was as respectably run as any other trade. The factories were well constructed; the workers belonged to a high class, and were well treated and well behaved. There was no justification for referring to the

trade as vicious. It was condemnation which sent the sale into underground channels. The same was true of propaganda. If clinics were supported which gave information which was sane, these lurid publications would cease to be profitable.

There had been a fall in the birth rate in most countries, whether Protestant or Catholic, in the Western world. If they took the years from 1880 to 1930 they would find a decline of 54 per cent in the birth rate in England and Wales, 43 per cent in Scotland, 42 per cent and 58 per cent in Catholic Belgium and Austria, and 42 per cent in Denmark. Turning to this country and this century, and taking the table of the birth rate per 1,000 married men under 55, there had been a steady fall in fecundity. That fall began among the professional classes. It was found first, for example, among ministers of religion, doctors, lawyers, and teachers. It then extended to people of other occupations, and it might now be said to have reached the artisan classes. There had been a legitimate fear that if there was a decline in fecundity in all these classes, except the classes of semi-skilled and unskilled labour, the result would be serious to the quality of the population. That would have been true if that fact had held. During one or two investigations there had recently been made a scientific inquiry into a group of wives of artisan and semi-skilled and unskilled citizens. That inquiry had had under its purview ten years—from 1923 to 1933. During that time there had been a total decline of the birth rate in the unskilled and semi-skilled classes of 14.4 per cent, and the decline was increasing, especially among the younger married men of 40 and under. What was more significant was that, if they took the gap of space between children in that class for that period of years, they found that the average gap had gone up by eight months. There was no surer evidence of birth control than a fall in the birth rate and an increase in the interval between children.

The sale of contraceptives had gone up almost by leaps and bounds. One firm at the present time turned out 8,500,000 articles a year; another firm dealing in contraceptives turned out 72,000 per week; and home production was reinforced by large importations from abroad. Contraceptives were now part of our social fabric, and to oppose them was to beat the air. No civil or military authority had ever succeeded in suppressing contraception. It had now been decided, for good or evil, that for economic and family reasons pregnancies should be limited, and that choice, not chance, should decide the size of the family. When told that these ends should be attained by self-control, young persons of today replied that they were being asked something which was new, and something which preceding generations in this

country did not practise. In effect, they were being asked to practise celibacy within the state of wedlock. In the prosperous forties of the last century the Gladstones and the Lytteltons often stayed together under the same roof. In 1847, on one of those occasions, there were eleven children of the two families under 7 years of age. On another occasion there were seventeen children under 12 years. There was not much evidence of abstinence in marriage there. Human nature had not changed since the forties of last century, nor had biological laws. The foundation of the home required physical love periodically repeated, yet no one would be rash enough to say in these days that families should be of equal size to those of the last century. Take a young couple who married, the man between 24 and 25 and the girl 21. They had a modest income, and properly, after the first child, or possibly the second, made up their minds that for a period of seven or eight years they would not be able to afford any more children. That could be done by abstinence, which, as a medical man, he thought would be impossible, or would lead to irregularities and eccentricities, which were serious matters. In 1847 the infant death rate was 172, sufficiently high to act as a safety-valve; today the figure was down to 65. Contraception had not sprung from any evil purpose or selfish impulse; it was outrageous to say that of the young generation. Contraception was right so long as it was properly carried out, with delicacy of feeling and proper restraint.—*Brit. M. J.*, 1934, 1: 313.

The Depression Restoring the General Practitioner?

The economic depression has done much to restore the general practitioner of medicine, the old-time family physician, to his former eminent position, stated Dr. Dean Lewis, professor of surgery at the Johns Hopkins Medical School and president of the American Medical Association, in an address before the recent Annual Congress on Medical Education, Licensure and Hospitals. While the medical profession has been studying the problem of too many specialists within its ranks, the depression seems to have contributed not a little toward relieving the situation, in Doctor Lewis's opinion. He said that the general practitioner has actually fared better during the depression than the specialist. This is because many persons have now learned that they can be treated satisfactorily in their own homes by their family physicians.

To encourage the restoration of the general practitioner, Doctor Lewis said that conditions of life in small communities must be made more attractive. In addition, young physicians must

be trained while in the medical schools to use laboratory procedures independently, so that they will not be dependent on the equipment and consultants which can be found only in large centres. Another important factor in restoring the general practitioner to his rightful place in the medical scheme is the problem of continuing his education after he has finished medical school. Doctor Lewis suggested that a systematic plan be worked out that will take medical advances directly to the physician practising on what might be called "marginal lands". Every such physician should have contact with a hospital, he added—*The Diplomat*, 1934, 6: 85.

A Cheaper Process of Making Cyclopropane

Cyclopropane, an anæsthetic which is becoming popular in some hospitals because its use is not followed by nausea and also because it is relatively safe from explosion, has been prepared cheaply from certain constituents of natural gas by three Purdue University chemists, Dr. H. B. Hass, E. T. McBee, and G. E. Hinds. The process by which they have lowered its cost to a fraction of what it used to be was reported at the recent meeting of the American Chemical Society.—*The Diplomat*, 1934, 6: 170.

Abstracts from Current Literature

Medicine

Erythema Nodosum and Tuberculosis. Ernberg, H., *Am. J. Dis. Child.*, 1933, 46: 1297.

Erythema nodosum is to be regarded as a symptom complex of a tuberculous nature, because, although no tubercle bacilli are ever found in the lesions, yet they are always associated with enlarged hilar lymph glands, cervical lymphomas of a tuberculous type, or with a phlyctenular conjunctivitis. Histological sections show erythema nodosum and subcutaneous tuberculin reactions to be similar in structure. Tuberculin injected after erythema nodosum has subsided will cause a mild relapse with recurrence of the erythema nodosum. The symptom-complex of erythema nodosum may be regarded as an autogenous tuberculin reaction, thus a process of an anaphylactic or allergic nature. This unique reaction occurs under certain conditions. One of these appears to be a certain stage of the allergic condition of a system infected with tuberculosis. In many cases the erythema appears at a very early stage of tuberculosis, more particularly at the transition from the pre-allergic to the allergic stage. In some cases a certain alteration of the

allergic condition after an acute infectious disease or other circumstances may produce erythema nodosum. The erythema nodosum occurs at the same stage in a tuberculous infection as that at which the allergy becomes positive, i.e., when the patient reacts to a dose of tuberculin. This interpretation of the symptom complex of erythema nodosum has certain consequences. In the treatment one of the most important guides is the estimation of the pulmonary gland process by means of x-ray examination. Tuberculosis with erythema nodosum has in most cases a favourable prognosis. The treatment is of importance in the prognosis, and rest in bed for at least four weeks and possibly months may be necessary to avoid the possibility of miliary or meningeal tuberculosis.

The fact that erythema nodosum usually represents an early stage of the tuberculous disease makes it important to try to ascertain the source of the infection. Frequently it is possible to trace it to a formerly unknown carrier, who has perhaps neither knowledge of his disease nor understanding of its danger as a source of infection.

Finally, this conception of the pathogenesis of erythema nodosum makes it possible by means of x-ray to study and observe the development of changes in the pulmonary glands at early stages of the tuberculous disease.

GUY H. FISK

Intra-uterine Rheumatic Heart Disease. Kissane, R. W. and Koons, R. A., *Arch. Int. Med.*, 1934, 52: 905.

The authors review 4 cases from the literature in which rheumatic heart disease was diagnosed in infancy at the time of, or shortly after, birth. They report a case of a child who was born with active rheumatic fever and a cardiac lesion, whose mother had suffered from this disease throughout her pregnancy. The diagnosis in the child was made on the presence at birth of red, painful swollen joints and abnormal heart sounds. The joint symptoms disappeared after six months, but the child suffered from marked dyspnoea and died from heart failure at the age of nine years. An autopsy revealed rheumatic heart disease with no evidence of congenital abnormalities. The heart was greatly enlarged, especially to the right, and it had rotated in such a way that the left auricle formed the right border of the heart. They infer from this case that the intra-uterine transmission of rheumatic fever and heart disease is not only probable but possible.

LEYLAND J. ADAMS

Sighing Respiration as a Symptom. Baker, D., *The Lancet*, 1934, 226: 174.

The author describes a disorder of breathing which, although common, has heretofore been

almost unnoticed in symptomatology. This disorder consists of a feeling of suffocation, the end of each respiration being accompanied by a sense of effort as if working against an obstruction. This comes on at any time, especially when the subject is tired, and may last for varying periods of time, being terminated by a deep sigh after which the patients can breathe freely and easily. It affects persons without physical signs of disease, and is generally associated with a group of symptoms expressive of physical or nervous exhaustion. It is frequently described by the patients as "breathlessness", but closer inquiry will immediately differentiate it from true dyspnea. It is of great value in assessing the part played by the nervous system in whatever condition the patient is seeking treatment for. Care should be taken to eliminate the possibility of asthma. Four cases are described illustrating the various degrees of severity of the symptom, from an occasional forced sigh to an attack lasting for hours.

Since in this condition the end of each inspiration is achieved with effort, as if against some obstruction, and since constriction of the thorax or abdomen gives rise to deepening respiration, it is believed that it is associated with a spasm of the diaphragm. The absence of any organic basis for the disorder makes the prognosis as to life good, but the symptom is often resistant to treatment and is liable to recur with the recurrence of nervous stress. It is best treated by explanation of the symptom to the patient and by eliminating any excess from his daily life. Bromides, valerian, nux vomica, and, occasionally, luminal, have all been helpful in treating cases at times.

GUY H. FISK

Surgery

Diverticulitis. Edwards, H. C., *Brit. M. J.*, 1934, 1: 973.

Diverticula are bottle-necked, thin-walled sacs opening from the colon. Secondary changes depend upon retention of faecal material. Diverticulitis is commonest in the sigmoid colon since diverticula are more frequent there, and the content is solid. Inflammation may produce perforation into the peritoneal cavity, or, at the other end of the scale, chronic fibrosis of the colonic wall. This latter process may extend, *i.e.*, perisigmoiditis, and may eventually result in obstruction. Acute inflammation added to a chronic reaction may produce localized abscesses. These may burst into a hollow organ or find their way externally. Uncomplicated diverticulitis gives a rather vague clinical syndrome. Pain, constipation, more rarely the passage of blood and mucus, frequency, and pain on micturition are the usual symptoms. Abdominal examination may reveal tenderness in the left

iliac fossa, and occasionally a lump in the same region. A clinical diagnosis should not be accepted. Radiological evidence is necessary to exclude the possibility of new growth.

The treatment of these cases consists in the avoidance of complications. Colonic lavage is insisted upon. Ordinary tapwater is probably as useful as any antiseptic solution. Two pints are used and the head of water should not exceed eighteen inches. The diet should be mainly vegetable. An excess of cellulose is to be avoided. Surgery in the treatment of diverticulitis is directed mainly at the complications. Adhesions make local excision rarely a possibility. When possible, radical procedures in the border-line cases are best. Temporary colostomy is doomed to failure. It does not allow sufficient rest to the inflamed gut. Cæcostomy gives imperfect drainage and is therefore not advisable. Permanent colostomy is necessary if the patient is to benefit. The wound should remain open for a minimum of 12 months and should be made as near as possible to the inflamed area. Operation is advisable in the interval between attacks.

One of the most dreaded complications is a colo-vesical fistula. The characteristic symptom is the passage of air and faecal material *per urethram*. Treatment is difficult. The radical one-stage operation should be abandoned. Colostomy and radical operation carries a relatively high mortality. Operation, preceded by a colostomy, should only be undertaken when the patient is comparatively young and the fistula recent. Spontaneous cure occurred in one case reported by the author.

STUART GORDON

Perianal Tuberculosis. Berry, F. B., *Ann. Surg.*, 1934, 99: 593.

Perianal tuberculosis may appear as (1) perirectal abscess; (2) fistula in ano; (3) soft, indolent perianal ulcer; (4) lupus; (5) submucous or subcutaneous nodular lesion; (6) or a hyperplastic type simulating neoplasm. The latter three are rare, as is a tuberculous lesion of the rectum. Tubercle bacilli reach the perirectal tissues through a diseased crypt or a local abrasion. They may occasionally arrive through the blood stream. If an abscess is formed it may appear as a typical ischio-rectal, or remain for a while as a non-tender, swelling near the mucocutaneous margin. Eventually secondary infection occurs and the abscess breaks down. A persistent swelling with a thin profuse watery discharge from an opening surrounded by unhealthy granulations results. The external opening of a fistula is large, with purplish overhanging edges. The discharge is copious, thin and creamy. There may be multiple external openings. The internal opening is usually single. This is generally superficial or between the sphincters. In the third variety a typical tuberculous ulcer is present at the mucocutaneous

junction. It spreads slowly either into the anal canal or outward into the subcutaneous tissue. It usually appears at the site of a pre-existing lesion, *e.g.*, fissure or hæmorrhoid.

Tuberculosis is present in only a small percentage of cases of *fistula in ano*; probably less than 10 per cent. In over 98 per cent the primary lesion is elsewhere. The incidence of tuberculosis in *fistula in ano* in patients with active pulmonary lesions is definitely increased. *Fistula in ano* may be the initial sign of tuberculosis. This disease should always be considered when a fistula appears in an underweight individual. The only proper treatment of perianal tuberculosis is excision. Secondly infected abscesses should be widely drained. Should a tract remain it is excised. If a fistula has two or more internal openings excision should be carried out in two or more procedures. Eighteen cases are reported by the author. All were treated by excision. Thirteen were cured. Details of pre- and post-operative treatment, are given.

STUART GORDON

Tuberculosis of the Breast. Lee, W. E. and Floyd, W. R., *Ann. Surg.*, 1934, 99: 753.

Tuberculosis of the breast is relatively uncommon. It has been suggested that it is always due to the bovine type of tubercle bacillus. The disease is much commoner in females. It is practically always unilateral. The majority of cases occurred between the twentieth and fortieth years. The organism may reach the breast through an abrasion, through the blood stream, or by direct extension.

Pathologically, mammary tuberculosis is best classified as follows: (1) acute miliary, (2) nodular, (3) sclerosing, (4) obliterans, and (5) various atypical forms. The lesion commences in the mammary stroma. After several months a palpable mass is formed. Rarely this exceeds the size of a hen's egg. It may become encapsulated and lie quiescent for a time, or it progresses to sinus formation. The sclerosing type is a slow progressive lesion and is most frequently seen in elderly people. The breast is not enlarged; the nipple may be retracted; sinus formation is rare. Tuberculosis of the breast is sometimes associated with adenoma or carcinoma.

A painless lump in the breast is the first thing noted in 75 per cent of the cases. In the remainder either pain, a discharge from the nipple, hardening of the breast, or sinus formation constituted the first indication. The physical findings vary with the stage of the disease. The mass may have all the characteristics of carcinoma. An unruptured abscess cannot be differentiated from a simple cyst. There is axillary lymph-gland involvement in over 50 per cent.

Tuberculosis usually occurs at a younger age and runs a more acute course than carcinoma. The absolute diagnosis is made by histological demonstration of a tuberculous lesion, or the development of tuberculosis in animals following inoculation of pus or scrapings from the lesion.

There are no cases of proved breast tuberculosis in which spontaneous regression has occurred. The treatment is surgical removal. Accompanying lymph-node involvement may be dealt with surgically, or may be treated by roentgenotherapy. If untreated other organs may be attacked and death result.

The prognosis following proper treatment is excellent in primary breast tuberculosis. In cases of secondary breast tuberculosis it depends upon the degree of tuberculous involvement elsewhere.

The author reports three cases.

STUART GORDON

Obstetrics and Gynecology

Hæmorrhage in the Later Months of Pregnancy. Hendry, W. B., *Am. J. Obst. & Gyn.*, 1934, 27: 408.

Hæmorrhage stands second only to infection and toxæmia as a cause of maternal death. Of 7,448 admissions to the Burnside Lying-in Department of the Toronto General Hospital during the last ten-year period there were 56 cases of placenta ablata, an incidence of 0.75 per cent, and 83 cases of placenta prævia, 1.11 per cent. Hendry prefers the term "placenta ablata" to that of "accidental hæmorrhage" with its suggestion of accident or injury. In the 56 cases of placenta ablata the hæmorrhage was concealed in 17, revealed in 30, and both concealed and revealed in 9 cases. Placenta ablata must be considered one of the complications of the late toxæmias, and might well be classified itself as one of the toxæmias. In 34 cases labour started spontaneously, 9 were induced by rupture of the membranes alone and 5 by the hydrostatic bag. Cæsarean section was performed in 3 and subtotal hysterectomy in 5 cases. Every case of hæmorrhage from the site of a normally placed placenta, whether moderate or severe, must be viewed with suspicion, and, whether labour starts spontaneously or is induced, the possibility of severe post-partum hæmorrhage should always be kept in mind and preparation made to control it.

In 83 cases of placenta prævia the placenta was described as central in 16, marginal in 47, and lateral in 20. Age did not appear to have any bearing on the etiology of the condition, but parity seemed to have etiological significance, as there were only 7 nulliparæ in the series, 20 primiparæ and 56 multiparæ, 17 of the latter having had from 4 to 15 pregnancies.

each. In 15 cases the hæmorrhage was mild, in 30 moderate, and in 38 severe. Twenty-four were either in labour on admission or went into labour spontaneously shortly afterward. Labour was induced in 36 cases and Cæsarean section was performed in 23 cases. Pituitrin was used intramuscularly in 10 cases and proved to be of value in controlling hæmorrhage and shortening labour.

Considering the whole series in retrospect, it appears to be in the best interest of the patients to employ such therapeutic measures as appear to be best suited to the individual cases, whether these measures are surgical or conservative, rather than to follow a cut and dried method of procedure in every case. Both the public and the profession should be constantly reminded of both the significance and the danger of uterine hæmorrhage in the later months of pregnancy. ROSS MITCHELL

Extensive Perineal Damage at Labour. Little, H. M., *Am. J. Obst. & Gyn.*, 1934, 27: 414.

In studying the cause of frankly complete tears involving the bowel one factor stood out, narrowing of the sub-pubic angle and shortening of the bi-ischial diameter. It is an obstetric axiom that when the bi-ischial diameter of any pelvis equals, but does not exceed, the distance between the blades of any standard forceps, then, during extraction of the head, both blades of the forceps, together with the major portion of the head must lie behind the bi-ischial line, in which event serious damage to the perineum is absolutely inevitable.

The ultimate results are for the most part excellent. Immunity from permanent fistula formation in Little's own cases was due to the fact that no catgut, save one fine strand to bring together the ends of the sphincter, was knotted in the perineum, and that approximation of tissues with non-absorbable material was invariably preferred to the use of buried catgut. After repair of the rectal mucosa, knots in the lumen of the bowel, the sphincter ends were approximated with very fine catgut, and silk-worm gut was then used to bring the torn or cut perineal body together, and also as a figure-of-eight to reinforce the fine catgut in the sphincter. Tissues should not be devitalized by too tight suturing, and the sphincter should not be anchored in the mucosa or overlying skin.

There is no danger from bowel activity after repair, unless purgatives have been administered. Opiates are absolutely unnecessary. Restriction to fluids for the first two days and to a diet with small residue for five days is no hardship. Care of the bladder is important.

Complete laceration of the perineum is essentially a matter of first deliveries. Too prolonged labour is undoubtedly a factor both in the production of damage and in the failure to heal subsequently. ROSS MITCHELL

Cardiac Disease in Pregnancy. Stander, H. J., *Am. J. Obst. & Gyn.*, 1934, 27: 528.

Pregnant patients suffering from heart disease may in general be divided into three groups, although these groups are not definite and often overlap. Group I comprises those who have some history of heart disease, who show a heart lesion, either congenital or acquired, but who have not had any sign or symptom of cardiac decompensation and who are able to stand the strain of every day life without any signs of decompensation. Group II includes those who have a cardiac lesion, have no history of cardiac decompensation, but who are forced to limit their activities. Group III takes in those patients who have a definite history of cardiac decompensation.

The treatment in the first class usually consists in careful ante-natal examinations and observation, admission to the hospital a week or two before term, with spontaneous delivery under ether anaesthesia. The treatment in the second class of patient is an even closer vigilance, admission to the hospital a month or more before term, and avoidance of the second stage of labour by application of forceps on full dilatation of the cervix. In the third class the treatment should undoubtedly be radical; in general pregnancy should not be allowed to continue, and subsequent pregnancy should be prevented by sterilization.

ROSS MITCHELL

Pathology and Experimental Medicine

Blood Cholesterol and Hypometabolism: Suprarenal and Pituitary Deficiency, Obesity, and Miscellaneous Conditions. Hurxthal, L. M., *Arch. Int. Med.*, 1934, 53: 825.

Since a lowered metabolic rate is sometimes found where the thyroid function is not deranged, whereas thyroid deficiency is always accompanied by hypercholesteræmia, it might be well to observe the blood cholesterol in other cases of hypometabolism.

There are a certain number of cases in which the metabolic rate is not a safe guide; others, where it does not seem directly related to the state of the thyroid. Is it possible that other endocrine glands affect the metabolic rate, that a hypometabolism without hypercholesteræmia might be unrelated to the thyroid?

The metabolism may be lowered by either thyroid, suprarenal or hypophyseal deficiency, the latter associated with chromophobe tumours. There is no doubt that the suprarenal plays a part in the causation of the hyperthyroidism picture. How important a part? On the other hand the thyroid is not deficient in Addison's disease, as hypercholesteræmia is not present.

There is, of course, an intimate relation be-

tween the pituitary and the thyroid; is the enlargement of the thyroid a reaction to the increased metabolism caused by the pituitary hormone, since the thyroid atrophies after hypophysectomy? A study of obesity cases which showed low metabolic rates without hypercholesteræmia shows they have not always a thyroid origin. Again myxœdematous patients are not all obese. Estimation of the blood cholesterol would have value in the managing of a case of obesity before launching the patient on the chartless sea of thyroid administration.

P. M. MACDONNELL

Diverticula of the Duodenum and Jejunum.

Edwards, H. C., *The Lancet*, 1934, 1: 169.

The author gives a fairly complete summary of the different types of diverticula that affect the duodenum and the jejunum. He gives a classification of these conditions. In his primary acquired diverticula of the duodenum he finds no muscle coat. He considers that the factors causing the diverticulæ are the presence of a weak area in the muscular wall, and, secondly, a pulsion force from within the bowel. In the duodenum he feels that it is usually associated with a pylorospasm, and that what calls for operative treatment in these cases is retention and large size. The pathogenesis in the jejunum is found in the abnormal behaviour of muscle fibres in contraction and relaxation, and the jejunal diverticula are not responsible for symptoms. The secondary or traction diverticula occur chiefly in association with an adherent gall bladder and are not of very great significance. It is found that the walls of these diverticula contain muscle fibres.

W. L. GRAHAM

The Hereditary and Familial Factor in Hypochromic Anæmia with Achlorhydria.

Barrow, W. H., *Ann. Int. Med.*, 1934, 7: 1135.

Achlorhydria associated with hyperchromic anæmia, as in pernicious anæmia, has long been recognized. Barrow reports its association in several members of a family with an anæmia in which the colour-index was less than 1. The family was comprised of three sisters, and the six daughters of one of them. The three sisters had always been anæmic according to the information given by the patient, but the existence of achlorhydria was not known in these cases. The six daughters of one of these women were anæmic, but only three were available for gastric analyses. These three however, showed diminution in the gastric acidity. Two had complete achlorhydria; the other had hypochlorhydria.

MADGE THURLOW MACKLIN

Therapeutics

The Treatment of Circulatory Failure.

Warfield, L. M., *Ann. Int. Med.*, 1934, 7: 981.

Cases of circulatory failure may be classified into two groups, (1) those accompanied by increased blood volume, and (2) those accompanied by decreased blood volume. Wollheim calls the first plus, and the second minus decompensation. The majority of the former are chronic and cardiac in origin, while the majority of the latter are acute and peripheral in origin.

The acute cases of minus decompensation correspond to circulatory failure in all the severe infections including pneumonia, the bronchopneumonia of grippe, and the toxic infectious diseases. In this type of circulatory failure, the following four conditions are found: (1) decreased blood volume and insufficient return flow; (2) concentration of the blood; (3) decreased blood chlorides; and (4) low venous pressure. With the lowered venous pressure the diastolic filling of the heart is lessened, the heart speeds up, and, as the pulse becomes smaller, the blood pressure falls until a point is reached when there is not diastolic pressure sufficient to carry on the circulation in the coronary arteries. The decreased blood volume is the result of increased osmotic pressure in the tissues due to katabolic changes initiated by the toxæmia.

Treatment should be directed toward correcting the four conditions listed above. In certain cases, the head-down position and crowding fluids by the mouth will suffice. In general, saline solution and 10 per cent glucose should be given intravenously in amounts up to 3 to 4 litres, or over, daily. Also, one can use transfusions of blood, or 6 per cent acacia solution, about 500 c.c. every 3 or 4 days. Blood not only increases and maintains blood volume and introduces important ions such as Ca, Na, and K, but adds oxygen-carrying red cells, which is important in the presence of anæmia.

Drugs to be recommended are those which increase blood volume. These are strychnine in adequate doses, caffeine sodium benzoate, metrozal, adrenaline and pitressin. Adrenaline may be added to the saline-glucose transfusion. Digitalis, except when auricular fibrillation exists, is contraindicated, chiefly because it decreases blood volume.

H. GODFREY BIRD

Rational Treatment of the Anæmia Patient.

Murphy, W. P., *Ann. Int. Med.*, 1934, 7: 939.

Rational treatment is possible only after a correct diagnosis has been made. This may be possible in some instances only during the time that the anæmia is present. The prompt and striking increase in reticulocytes during the ten days immediately following the intra-

muscular injection of liver extract is practically limited to patients with pernicious anemia in relapse, and this therapeutic test may be of aid in making the diagnosis.

The author cites observations which suggest that in pernicious anemia the potent substance, when injected in excess of immediate needs, is stored for later utilization. Following the initial intramuscular injection of extract from 400 grams of liver, and without subsequent injection, the red cells have been found to increase in some instances at rates as high as 135,000 cells a day for 28 days. Although a number of patients have remained in excellent health with the injection of extract from 100 grams of liver at intervals greater than four weeks, it would seem wiser to give the injections at intervals of four weeks or less. Iron in large doses is often of value in pernicious anemia, especially for those patients taking liver extract.

Studies carried out in the author's laboratory have shown that large amounts of whole liver may be substituted for iron in the treatment of patients with idiopathic hypochromic anemia. The liver, however, is not superior to the iron, and is more difficult to take. When liver is given together with iron, the effect is greater than with either iron or liver alone. Liver extract, given intramuscularly, has no apparent effect on the formation of hemoglobin if given alone, but if given with large doses of iron by the mouth there results a more rapid response of the hemoglobin and of the red cells than occurs with the use of a similar amount of iron alone. The preparations containing iron and copper have produced no effects greater than might be expected from the iron contained therein. Ferrous carbonate, 60 grains daily, and ferric ammonium citrate, 45 grains daily, have produced satisfactory clinical results. Evidence available indicates that larger doses of iron are not more effective, and are, therefore, generally unnecessary.

H. GODFREY BIRD

The Ketogenic Diet in the Treatment of Infections of the Urinary Tract. Robb, D. C., *Brit. M. J.*, 1933, 2: 1158.

Sixteen cases of urinary tract infection, treated by ketogenic diet, are presented. The details of dietary treatment are given. The ketogenic diet had the effect of increasing the hydrogen-ion concentration of the urine in all but one case; there was a rapid initial fall in pH, a maintained low level till the end of the third week, and then a tendency for the pH to become irregular and rise slightly. Acetonuria was always present, but varied greatly in amount from case to case; not corresponding with the degree of urinary acidity present. Five patients were cured completely, the urine being sterile on repeated culture; in these cases a pH of about 5.4 was reached and maintained.

Four were successful only after the addition of ammonium nitrate to the treatment, and two others, after hexamine. Five patients were improved, but not cured. In each case the ketogenic diet was instituted by stages, and the ketogenic-antiketogenic ratio was determined in each case by simple calculation. An average 3:1 ratio diet would be P. 64 grm., C. 19 grm., and F. 249 grm. Little gastric upset was produced by the diet, and all the patients left hospital in excellent health. It was felt that this method of treatment was unsuitable for use in out-patient clinics.

W. FORD CONNELL

Hygiene and Public Health

Silicosis among Granite Quarriers. Bloomfield, J. J. and Dreessen, W. C., *Pub. Health Rep.*, 1934, 49: 679.

It is a common belief that granite quarrying is not so dangerous as granite cutting in enclosed sheds. The authors report a study of a typical quarry in Vermont. Dust counts were made of air samples and 39 drillers who presented themselves voluntarily were examined by clinical and radiographic methods. Dust counts in millions of particles per cubic foot of air varied from an average of 144.4 to 36.9 for drillers. Other workers were exposed to an average of 5.8. When it is remembered that counts over 10 million are considered dangerous to granite workers it is apparent that a real hazard exists in this work. The examination of the 39 drillers showed that 10 were suffering from silicosis. Two out of 4 workers with ten or more years of exposure, and 4 out of 5 workers, with twenty or more years of exposure, were suffering from silicosis. It is suggested that the only solution of this problem lies in the removal of the dust at its source. Wet drilling is recommended where possible, and also the use of the Kelley dust trap.

FRANK G. PEDLEY

Urology

Aseptic Ureter-intestinal Anastomosis. Higgins, C. C., *J. Urol.*, 1934, 31: 791.

The procedure described is similar to the transfixion suture method of Coffey, in that a fistula is established between ureter and bowel without actually opening the bowel at operation. In the Coffey method, however, the ureter is severed at the point of transplantation, and obstruction is present for 48 to 72 hours until the fistula is established. With the author's method the normal flow of urine is not interfered with and bilateral simultaneous implantation is possible. The abdomen is opened and posterior parietal peritoneum incised over the ureter, which is then freed for 8 cm. The site of implantation in the recto-sigmoid is then selected, and an incision of 6.5 cm. is made

along one of the longitudinal bands down to the mucous membrane. Lateral separation of serous and muscular layers provides a trough for the transplanted ureter. The ureter is then brought into position, and 1 cm. from the lower edge of the incision in the bowel a silk suture is passed through the wall of the ureter into the lumen, then through the mucous membrane of the bowel, picking up the gauze which has been wrapped about a rectal tube and placed in the rectum previously to operation; it is then tied tightly. The muscular and serous layers are now reapproximated and the post-parietal peritoneum closed. The fistula forms in 36 to 60 hours, and during this time there is no interference with the normal continuity of the ureters. There appears to be very little clinical reaction after the operation. It has been performed on dogs in eight cases with excellent results. After the fistulae are established the bladder is removed and ureters ligated below the anastomosis. In dogs this has been done intraperitoneally, and in human cases, extraperitoneally.

N. E. BERRY

Cystectomy for Cancer of the Bladder in the Male. Coffey, R. C., *Trans. West. Br. Am. Urol. Ass.*, 1933, 2: 94.

The early diagnosis of bladder tumours is possible because it is an irritable organ where any disturbance asserts itself early, and also because of exact diagnostic methods. Despite this, and despite the late appearance of metastases, a great majority of the cases treated by fulguration and radium tend to return with ultimate bad results. Since the introduction of satisfactory methods of transplanting the ureters into the large intestine cystectomy has become a feasible procedure, and will, if performed early, bring a cure in a larger percentage of cases than follows operations for cancer affecting any other organ. The author suggests therefore that one should not wait too long before in dealing with these growths before undertaking radical procedures. In men, cystectomy and transplantation of the ureters should be carried out at one sitting, as it is simple when the abdomen is already widely open, and the better drainage afforded by the gauze pack in the vesical space more than compensates for the additional operation of cystectomy. The bladder is removed in retrograde fashion, starting at the neck, severing the urethra, and pulling the prostate upward and forward. The ureteral transplantation is performed by Technique 2, in which large catheters are anchored in the ureters during convalescence. An analysis is presented of 11 cases treated in this way with very satisfactory results. Excellent illustrations of bladders removed with growths are included.

N. E. BERRY

Ophthalmology

The Influence of Ametropia on Certain Infections of the Adnexa of the Eye (lids, lachrymal tract). Robert, G., *Ann. d'Ocul.*, 1933, 170: 663.

Fatigue of the eyes, though slight, when prolonged, even when caused by ametropia of small degree, affects in certain cases the lids and lachrymal tract and the eye itself. In these cases there are present asthenopia, varying according to the age of the patient, and also infectious processes, particularly if the surrounding cavities are infected which make the patient susceptible.

In the presence of infectious manifestations, it is necessary to make a thorough examination of the refraction and to correct this as nearly as possible. Small degrees of ametropia should not be neglected. Except in rare cases a normal eye as a whole is not easily accessible to infection, so that if this does appear, and particularly if it becomes chronic, it is necessary to look for a local cause. We begin by correcting the ametropia and follow this by the usual orthodox treatment.

These ideas are the same as those expressed by Prof. Lagrange on the necessity of complete refractive correction as the basis of all satisfactory treatment of these eye conditions.

S. HANFORD MCKEE

The Value of the Mantoux Reaction as a means of recognizing the Tuberculous Character of Ocular Affections. Braun, R., *Ann. d'Ocul.*, 1933, 170: 267.

Brown experimented with the Mantoux (Mendel) reaction in 200 cases, and concludes that it is not at all an aid in the diagnosis of tuberculosis. Comparing cases with tuberculosis and without tuberculosis, the reaction was found positive in only 20 per cent more of the first group than in the second. He does not believe that the Mantoux reaction assists in any manner in the diagnosis of ocular tuberculosis.

S. HANFORD MCKEE

Ocular Complications of Acne Rosacea. Adamantiadis, B., *Ann. d'Ocul.*, 1933, 170: 760.

The effect of acne rosacea of the face, on the eye, particularly on the cornea, was first described by Arlt in 1864. Since that time there have been many communications by different authors, with the complete study by Peters and his pupils Erdmann and Triebenstein, who determined the different forms in which this malady shows itself in the eye.

Among 5,000 patients Adamantiadis saw 3 cases of ocular-rosacea, and from reference to the ordinary text-books the writer concludes that the condition is a rare one. One of the principal features of rosacea is the telangiect-

tases of the already congested coats. They are found usually in the locality of the rosacea, on the conjunctiva and the sclera and part of the cornea. The lesion is a localized telangiectasis, of an eruptive nature. The veins appear dilated and tortuous around the aene lesion. Another feature of the malady, equally important, is the chronicity of the manifestations, discouraging alike both for the patient and the physician.

Of the 3 cases reported, the first two are not of special interest. In the third case, however, the patient, of 7 years, had had the lesion since his first year. The lesions of the anterior parts of the eye had healed and recurred constantly, taking a chronic course very slightly different from that usually seen.

S. HANFORD MCKEE

Neurology and Psychiatry

Spinal Cord Tumours. Grant, F. C., *Am. J. Surg.*, 1934, 23: 89.

This is a study based upon a series of 18 verified spinal cord tumours. A relatively high proportion of the benign fibroblastic type of tumour was found, in comparison with the brain where the infiltrating gliomas are the more common. Pain, which was increased by coughing or straining, was the first symptom of cord tumour in 13 cases. Fourteen patients had numbness or tingling in areas below the level of the tumour and in all of these cases subjective sensory disturbances preceded motor disturbances. Pressure on the cord is seldom limited to one side only. Hence the Brown-Séquard syndrome is rarely clean-cut, and frequently a reversal of sensation occurs, with the greatest sensory loss upon the same side as the tumour and more motor disturbance on the opposite side. In the development of motor symptoms one lower limb usually becomes involved before the other. In 17 of the 18 cases hyperactive reflexes with clonus and Babinski's sign were recorded on one or both sides.

The most important single factor in securing a favourable result is early diagnosis and removal of the tumour. The type of tumour and its position in relation to the circumference of the cord cannot be determined with certainty prior to operation. In the early stages when atypical histories and bizarre neurological findings make diagnosis more difficult recourse must be made to certain mechanical methods of localization. Every case of suspected cord lesion should have a lumbar puncture, plus a Queckenstedt test and estimation of the spinal fluid protein. If the sensory level is definite, and if a simple Queckenstedt test reveals no block, and the protein of the fluid is normal, the condition is probably not tumour. If further verification is needed a combined cisternal and lumbar puncture, with a Quecken-

stedt test and comparison of the protein content of the fluid from these two situations, should be made. If there is any indication of block, and if the sensory level is uncertain, then opaque oil should be employed.

FRANK A. TURNBULL

Multiple Sclerosis and Amyotrophies. Davison, C., Goodhart, S. P. and Lander, J., *Arch. Neurol. & Psychiat.*, 1934 31: 2.

Finding that 12 out of 20 cases of multiple sclerosis coming to autopsy and 17 of 110 cases studied clinically showed atrophy of one or more groups of muscles, the writers feel that such a high incidence of correlation merits further study. The appearance of muscular atrophy would tend to even further confuse the protein clinical picture of multiple sclerosis with that of amyotrophic lateral sclerosis.

The autopsy findings on three cases are presented. The muscular atrophy was due to destruction of the anterior horn cells by the invasion of a disseminated plaque. This was most frequent in the lower cervical region and hence the intrinsic hand muscles were the commonest group involved. Of the twelve cases in this atypical group four showed well marked mental changes.

G. N. PATERSON-SMYTH

Pellagra in Association with Chronic Alcoholism. Zimmerman, H. M., Cohen, L. H. and Geldea, E. F., *Arch. Neurol. & Psychiat.*, 1934, 31: 36.

The authors describe three cases of chronic alcoholism associated with findings in the nervous system suggestive of pellagra. One case presented the typical cutaneous lesions, and all three showed very marked improvement on a high-vitamin diet. Official examination of the nervous system showed, apart from mental changes of a deteriorative type, evidence of a pyramidal lesion (increased deep reflexes, absent abdominal and positive Babinski and Hoffman signs), and sensory loss. There was also degeneration to a lesser extent in the peripheral nerves. The pathological findings showed a fairly characteristic neuronal change of the so-called axonal type, associated lipoid deposits, and hyalinization of the capillaries. Much more striking however was the severe grade of demyelination found in the posterior and lateral columns (pyramidal tracts). Their conclusion is that chronic alcoholism, by producing a loss of appetite or by interference with assimilation, led to a vitamin deficiency producing the pellagrous condition.

G. N. PATERSON-SMYTH

Dermatology

Malignant Melanomas Arising in Moles: Report of Fifty Cases. Butterworth, T. and Klauder, J. V., *J. Am. M. Ass.*, 1934, 102: 739.

Malignant change may occur in a mole at any age, but the average age is 47. It is much more common in males and occurs almost exclusively in the white race. In an analysis of 598 cases, malignant melanomas developed from moles located as follows: head, 16.5 per cent; neck, 7.7 per cent; trunk, 15.5 per cent; genital and anal regions, 2.7 per cent, and foot, 52.3 per cent. Contrary to popular belief, malignancy is just as likely to develop in brownish coloured melanomas (moles) as in the deeply pigmented ones. Trauma appears to play a rôle in the onset of malignancy in about 20 per cent of cases. The first evidence of malignant change is increase in size, and this may be followed by, or associated with, increase in pigmentation and bleeding. Melanuria and generalized pigmentation occasionally occur.

When malignancy is suspected, the authors advocate wide excision of the affected site, preferably by electro-surgery. This is followed at once by heavily filtered, high voltage x-ray to the operative site and to the neighbouring lymph glands. If the malignant lesion is on an extremity, amputation should be seriously considered. In the 50 cases reported, 26 patients were dead in two years and a half, 6 are still living after three years, and 14 are still living, but the duration of time since the onset of the malignancy is less than three years.

In conclusion, the authors offer some very sage advice regarding the treatment of melanomas (so-called moles or naevi). "Thorough destruction, including healthy tissue surrounding the lesion and beneath it by means of the electro-cautery, electro-dessication, or surgical excision affords the safest means of removing pigmented naevi. The naevus should be entirely destroyed at one operation. To treat the lesions by painting with acids, by applying carbon dioxide snow, by electrolysis, strangulation by tying a string around a pedunculated lesion, or any treatment given at short intervals are dangerous procedures which constitute irritation and afford opportunity for malignant change. In propaganda for the control of cancer, this principle cannot too strongly be emphasized."

NORMAN M. WRONG

Lymphogranuloma Inguinale, the Fourth Venereal Disease: Its Relation to Stricture of the Rectum. Cole, H. N., *J. Am. M. Ass.*, 1933, 101: 1069.

This disease has been more or less recognized for seventy-five years, but Nicolas, Favre and Durand, in 1913, were the first to give good clinical and histological descriptions of it. Numerous cases have been reported from France, South America, Cuba and lately from

the United States. Cole's clinic in Cleveland has furnished the first complete reports and the greatest number of cases. Frei, in 1925, reported an intracutaneous test which has proved to be specific in this disease and of great value in the diagnosis of the obscure cases.

An excellent review of the clinical course is given by the author. This consists of an evanescent primary sore and then lymphatic enlargement, softening, and the formation of multiple fistulae. The non-syphilitic, non-tuberculous, chronic inflammatory reaction about the rectum and anus is next discussed. The type which has multiple fistulae and progresses to marked scar formation and anal stricture is often due to lymphogranuloma inguinale. In these cases, the Frei test is positive. This ano-rectal syndrome is much more common in the female than the male.

NORMAN M. WRONG

Anæsthesia

Spinal Anæsthesia in Hypertension. Hyman, A. S., *J. Am. M. Ass.*, 1933, 101: 1410.

The depressor action of spinal anæsthesia has long been known. In 1931 a study of 3,000 administrations was made. Some drop in both systolic and diastolic levels of the blood pressure occurred in 92.4 per cent. The fall averaged from 10 to 38 mm. of mercury in patients exhibiting no cardiovascular disease. In those with high blood pressure the depressor effect was most marked, the higher the systolic level, the greater being the fall. In one case it was from 260 to 110, and in another from 248 to 128. In practically all cases with a pre-operative systolic level of 220 and above there was a drop of 50 mm. This was suggestive for the treatment of arterial hypertension, approaching the prodromal phase of cerebral hæmorrhage. Venesection is often life-saving, but the secondary anæmia frequently associated with this condition may be markedly accentuated by the removal of large quantities of blood. Besides the actual fall obtained by the removal of 500 to 1000 c.c. is not more than 30 to 50 mm. The first patient treated by spinal anæsthesia was a man, aged 58, with signs and symptoms of impending cerebral hæmorrhage. His blood pressure on admission was 244/120. He was given $\frac{3}{8}$ of the usual dose of tropocaine, and within 20 minutes the blood pressure fell to 180/110. Ten minutes later it was 168/105. There were no unfavourable cardiac signs, and within an hour nearly all the previous symptoms, with the exception of the posterior headache, had cleared up. Blood pressure readings were taken every 4 hours for the next week and showed a slow rise in the systolic component to 210 mm. The patient remained free from symptoms for several months. This case was followed by 11 others of the same type with the same general response.

ARTHUR WILKINSON

Obituaries

Dr. Thomas P. Bradley, of Sarua, Ont., died on June 30, 1934. He was born in 1873 and graduated from Trinity University in 1898. He is survived by his widow, formerly Helen G. McPherson.

Dr. Antoine Paul Cartier of St. Hyacinthe, Que., formerly Conservative member of the Quebec Legislative Assembly for the county of St. Hyacinthe, died on July 10, 1934, at the advanced age of 85 years. He was born at St. Antoine-on-the-Richelieu on June 17, 1849, the son of Narcisse Cartier. He was related to Sir George Etienne Cartier, one of the fathers of confederation. He conducted his classical studies at the Seminary of St. Hyacinthe and studied medicine at Montreal, receiving his degree in 1873 from Victoria University, Cobourg. After practising his profession at Coaticook for about two years he established himself at St. Madeleine, where he practised 44 years.

Dr. Cartier was a pioneer in the parish of St. Madeleine, mayor for several years, prefect of the county, and governor of the College of Physicians and Surgeons. He held an honorary doctorate from Bishop's College, Lennoxville (1895). He had the distinction of being the only Conservative member which the county of St. Hyacinthe has ever sent to the provincial legislature.

Dr. Cartier is survived by his wife, née Marie Ernestine Lenohlet-Duplessis; and three sons, Jacques Narcisse, of St-Gabriel de Brandon, Jean, of Montreal, and Paul, professor of chemistry at the University of Montreal; two daughters, Pauline, wife of Dr. J. E. A. Collette, and Alice, wife of W. Déziel, Montreal.

Dr. Robert Crosby, one of the most prominent and highly respected members of the profession in Vancouver, died suddenly on July 5th from coronary thrombosis.

Dr. Crosby was born at Campbellford, Ont., in 1870. He graduated from Toronto University in 1899. After practising for four years at Byng Inlet he went to New York to pursue post-graduate studies, finally becoming house surgeon at the Brooklyn Eye and Ear Hospital. In 1908 he settled in Vancouver, practising ophthalmology and otology, and soon became widely known throughout British Columbia. He was connected with the Vancouver General Hospital from 1915, his being one of the first appointments when the Out-Door Department was opened. Later, he was appointed to the senior staff, and in 1931 to the consulting staff. In 1901 Dr. Crosby married Miss Isabelle Peters, a sister of the late Dr. George A. Peters, of Toronto. He is survived by his widow, two sons, and two daughters. A firm adherent of his faith, he was for many years an elder of St. John's United Church.

Dr. Crosby was one of those physicians who add lustre to the profession through the respect of the community, earned by that conscientious and skilful treatment of all classes of patients which was exemplified in his work as ophthalmic surgeon to the Indian Department. Of a rather retiring disposition, he was, nevertheless, a man of marked force of character; he never hesitated to state his position on a question, but with a characteristic frank straightforwardness which left no rancour behind it. Like Chaucer's Knight, he was "honoured for his worthynesse".

COLIN GRAHAM

Dr. J. Émile Daignault, of Sherbrooke, Que., died suddenly on July 11, 1934, at the Saint Vincent de Paul hospital. He was born in 1886 at Lawrenceville, the son of Dr. and Mrs. Alphonse Daignault. He conducted his classical studies at the Seminary of Ste. Marie de Monnoir, and his medical studies at the

University of Montreal, from which he graduated in 1912. He is survived by his widow, née Blanche Paradis; two children; a sister and a brother.

Dr. Louis Doray died during the first week of July, 1934, in Montreal, at the age of 60 years. He had practised medicine for more than thirty years at Pont-de-Lac near Three Rivers. He is survived by three brothers, Arthur and Henry, Dr. Raymond Doray, all of Montreal; and one sister, Cécile.

Dr. Aubrey Taylor Fuller, of Vancouver, died at his home, on July 15, 1934. The late Dr. Fuller was born at Furo, N.S., in 1875. He received his B.A. at Mount Allison in 1897, and his M.D., C.M., at McGill in 1901. He had practised in Vancouver for thirty-one years, a quiet hard-working general practitioner of the old school. Never active in association affairs, he was nevertheless known to his intimates as a man of rare judgment, kindly and conscientious, and with a keen and sparkling wit. He had studied in London and Dublin, and his reminiscences were at all times interesting. He served throughout the war with the C.A.M.C.

Dr. Thomas Symes Genge, of Verona, Ont., who practised medicine at Parham and Verona for thirty years, died recently at Verona. He was born in 1870 and was a graduate of Queen's University, securing his degree in 1901. His widow, three sisters, and three brothers survive.

Dr. Georges Gernon, of Sainte-Geneviève de Pierrefonds, died on July 1, 1934, aged 80 years. He was a graduate of the medical school of the University of Bishop's College, Montreal, in 1879.

Dr. Gerald Stinson Glasco, of Hamilton, Ont., member of the local Lunacy Commission and Director of the Mental Hygiene Clinic of the Board of Health, died on July 22, 1934, in his 63rd year. He was born in Hamilton and had lived there all his life. He attended Central School, Central Collegiate Institute, and graduated from the University of Toronto in 1893. Later, he took a post-graduate course at St. Bartholomew's Hospital, London, and had practised in Hamilton since his return. The late Dr. Glasco was a pioneer in psycho-analysis in Canada, commencing this phase of medical work in 1915.

He became recognized quickly as an able specialist and consultant and as a member of the local Lunacy Commission and director of the Mental Hygiene branch of the Health Department performed outstanding service.

In religion he was an Anglican and a member of Christ Church Cathedral. Surviving are his widow; three sons, Ivan, of Hamilton; Allan Ewart, London, Eng., member of the Royal Tank Corps; Colin Stinson, of Montreal; and a daughter, Margaret, at home.

Dr. Henry Howitt, Sr., of Guelph, Ont., passed away suddenly at his home on July 22, 1934, in his eighty-sixth year.

Dr. Howitt was internationally known for the work which he did in the development of special techniques for perforation of the stomach and spinal surgery, and he had gained a wide reputation throughout Canada and the United States. He was one of the first pupils of Lawson Tait, the famous English surgeon. He was in practice in Guelph for over forty years.

A lifelong resident of the district of Guelph, Dr. Howitt was born at the Howitt homestead, the Grange, Guelph Township, a son of the late John Howitt and

Margaret McIntosh. He studied at Victoria and Trinity Universities, graduating as gold medallist at the latter in 1873. He became a member of the Royal College of Surgeons the following year, and in 1875 commenced to practise in Guelph, continuing until 1918.

Dr. Howitt became a Fellow of the American Association of Obstetricians and Gynaecologists, and he was a foundation member of the American College of Surgeons. He was also a former President of the Guelph Medical Society and St. George's Society. Dr. Howitt was also elected an honorary member of the Western Medical Association for meritorious work. He was a former President of the Guelph and Ontario Investment and Savings Society, senior surgeon of the Guelph General Hospital and St. Joseph's Hospital.

In 1875, Dr. Howitt married Grace Davidson, and on her death married Clara Kate Skinner, of Braeside, Guelph. He is survived by his widow, and four children of his first marriage: Mrs. P. D. Ivey, Oakville; J. R. Howitt, K.C., and Dr. H. O. Howitt, Guelph, and Mrs. E. P. Flintoft, Montreal.

Dr. Louis Legault, of Cornwall, Ont., who had been in practice in Cornwall for the past year, died suddenly at his home in East Cornwall on July 11, 1934. Retiring the previous night in his usual health, Dr. Legault failed to arrive at his office in the morning. Later he was found dead in bed.

Dr. Legault was born at St. Isidore, Ont., 59 years ago and he was a graduate of University of Montreal (1901). He practised at St. Stanislas de Koska, Que., and later at Chrysler, Ont. Subsequently he opened an office in Cornwall. He leaves three sons and a daughter. His wife died two years ago.

Dr. Victor J. Levasseur, of St. Johns, Que., died in the St. John's Hospital after a week's illness. He was born in St. Angèle de Laval in 1886, studied at the University of Montreal, and since 1912 had practised in St. Johns.

He leaves one son, James; his wife had predeceased him.

Dr. Thomas McCurdy, of Coaticook, Que., died about August 5, 1934.

The late Doctor McCurdy was a native of Orms-town, Que., and was in his sixty-seventh year. He studied at Huntington Academy and took his degree in medicine at McGill University in 1889. He first practised his profession in Sutton, then in Sawyerville, and for the past twenty-nine years in Coaticook. In 1893 he married Miss Olo Knight, of Coaticook, who survives him with one daughter, Eloise.

Dr. McCurdy was district physician for the Canadian National Railway. He was a great sportsman and was actively interested in the local Chamber of Commerce, in which he occupied several positions of trust.

Dr. Fulton Schuyler Vrooman, of London, Ont., formerly superintendent of the Ontario Hospital on Queen Street, Toronto, and of the provincial mental institution in Mimico, and who for the last four years had held a similar post at the Ontario Hospital in London, died on July 10, 1934, in Victoria Hospital, London. He had undergone an operation for appendicitis.

Dr. Vrooman was born in Lindsay, Ont., in 1882 and was a graduate of the University of Toronto (1904). He served overseas with the C.A.M.C. and was stationed at Orpington, Kent. He also, later, was in charge of the first hospital for shell-shocked men, located in Cobourg, Ont.

News Items

Great Britain

The British Industries House.—Another important stage in the development of British Industries House, London, which is to provide a permanent and comprehensive marketing centre for the Empire, and which was opened on July 2nd, was reached on July 19th when Lord Derby opened the Medical Section and Model Hospital suite.

The hospital unit, which is claimed to be the most up-to-date in the world, has two completely equipped operating theatres for major and minor operations, a clinical laboratory and rooms for surgeons, anaesthetists and sisters. There is also a sun balcony for convalescent patients. Apart from the hospital there are two other medical sections. In one is displayed a full range of British-made instruments and apparatus, to meet every need of the medical and surgical side of hospital work. The other section is a manufacturers' pattern and sample department for commodities needed on the lay side of hospital maintenance.

The object of the twelve-bed ward and the two medical sections is to provide the overseas purchaser with one central organization in which he can find all the goods in which he may be interested, and thus be saved the time and expense of travelling to different parts of the country.

The Reception Committee at the opening of the Medical Section was Lord Dawson of Penn, President of the Royal College of Physicians; Lord Horder, Physician in Ordinary to the Prince of Wales; Lord Moynihan, Chairman of the Army Medical Advisory Board; Sir Humphry Rolleston, Bart., Physician Extraordinary to the King; and Sir Holburt J. Waring, President of the Royal College of Surgeons. In administering the Medical Section, British Industries House has the advantage of the services of the following Advisory Council: Mr. Alfred Cox, O.B.E., M.A., M.B., LL.D., (Chairman); Mr. A. R. Melhuish, M.P.S.; Sir Crisp English, K.C.M.G., F.R.C.S.; Mr. E. P. Poulton, M.D., F.R.C.P.

A qualified medical practitioner and technical experts are attached to the section in order to assist intending buyers.

Apart from the individual exhibitors representing numerous industries who have already installed their showrooms in British Industries House, plans are nearing completion for geographical and industrial group exhibits. Prominent among these is Sheffield stainless steel for which a large area has been reserved. Various townships are also negotiating for space in which to display their products.

One of the most interesting features of British Industries House is the luxuriously appointed Buyers and Merchants Club, which enables business to be transacted in pleasing surroundings.

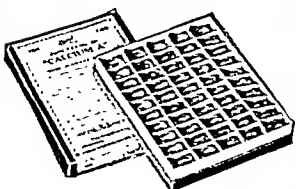
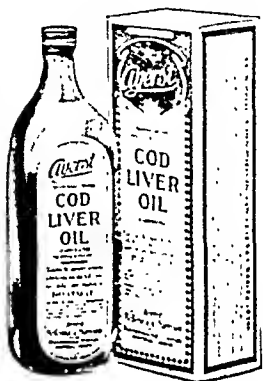
British Industries House is one of the largest and most completely equipped of London's modern buildings. It occupies a prominent central position adjoining Marble Arch and is under the control of five insurance companies.

British Columbia

At the time of writing this the medical profession and the community as a whole are profoundly shocked over the very serious injuries sustained by Dr. A. P. Procter, on August 3rd. Entering his office at lunch time, he was shot down without warning by a man seated in the waiting room. Latest reports indicate that he has a hæmothorax, but that he is holding his own, which under the circumstances must be regarded as encouraging.

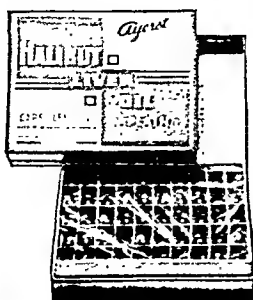
During the past month, medical men throughout the Province have received questionnaires relating to Health Insurance, one from the Council of the College,

this question of **HALIBUT OR COD**



Unquestionably, Halibut Liver Oil has definite therapeutic merit—so has, of course, Cod Liver Oil. But Halibut Liver Oil cannot take the place of Cod Liver Oil. Halibut Liver Oil is being widely advertised as a substitute for Cod Liver Oil. It is NOT a true substitute and cannot properly be described as "Cod Liver Oil by the drop." Halibut Liver Oil is rich in vitamin A and provides an excellent medium for VITAMIN A THERAPY, but, being relatively low in vitamin D, it cannot be used economically as an anti-rachitic agent.

Cod Liver Oil is the "gold standard" of vitamin A and D therapy, and long clinical experience has established the fact that the vitamin A and D ratio in Cod Liver Oil is sound and practical. Every physician appreciates the value of Cod Liver Oil "by the teaspoonful," and it is probable that Halibut Liver Oil has had its greatest appeal because of the convenience of its capsule form. Where convenience is a factor in Cod Liver Oil therapy we offer Alphamette Liquid, and the capsule forms, Alphamettes and "Calcium A." These three products are prepared for the convenient application of Cod Liver Oil therapy and faithfully retain the same "gold standard" values of vitamins A and D as exhibited in good medicinal Cod Liver Oil. Each Alphamette exhibits the full vitamin value of three teaspoonfuls of Cod Liver Oil and each "Calcium A" Capsule that of one teaspoonful in association with organically combined calcium and phosphorus. The choice as between Halibut Liver Oil and Cod Liver Oil rests primarily with the physician. We endeavour to supply products which meet the demands of the profession, and therefore, offer capsules of Halibut Liver Oil "Plain" and "250-D" which conform with the standards of potency set up by the Council on Pharmacy and Chemistry of the A.M.A.



AYERST, McKENNA & HARRISON
Limited

Pharmaceutical and Biological Chemists

MONTREAL

CANADA

Ontario

The Sixth Post-Graduate Course at St. Michael's Hospital, Toronto, is announced as follows:

September 10th.—"Sub-acute combined degeneration of spinal cord", Dr. J. London. "Migraine", Dr. McPhedran. "The nervous patient", Dr. W. Edmonds. *Clinics.*—Staff of Ear, Nose and Throat Department.

September 11th.—"Colitis", Dr. A. J. Mackenzie. "Clinical correlation of chest and abdominal conditions", Dr. D. Prendergast. "The peptic ulcer", Dr. J. Daly. *Clinics.*—Staff of the Eye Department.

September 12th.—"Clinical correlation of heart and lung conditions", Dr. T. G. Heaton. "The heart in general practice", Dr. A. R. Hagerman. "Clinical diagnosis by laboratory methods", Dr. J. C. Lyons. *Clinics.*—Dr. McPhedran's Unit Medical Wards.

September 13th.—"Pneumothorax therapy", Dr. J. Elliott. "Non-tuberculous pulmonary disease", Dr. E. A. Broughton. "A short series of treatment in hay fever", Dr. R. Smylie. *Clinics.*—Dr. Mackenzie's Unit Medical Wards.

September 14th.—"Endocrine diseases", Dr. G. Cragg. "Vitamin therapy in practice", Dr. A. Hethrington. "Common skin diseases", Dr. F. A. Ireland. *Clinics.*—Dr. Elliott's Unit Medical Wards.

September 15th.—"Anæmias", Dr. H. Hall. "Surgical difficulties", Dr. M. H. V. Cameron. "Acidosis", Dr. F. J. Colling.

All doctors are heartily welcome, and no fees will be charged. If further information is desired, please communicate with Dr. W. B. Edmonds, Medical Arts Bldg., Toronto.

Quebec

The Montreal Medico-Chirurgical Society announce their Second Annual Convention which will take place in Montreal on Friday and Saturday, October 26th and 27th. The program will consist of clinical addresses and special ward demonstrations in all branches of medicine, surgery, and the specialties. These clinical sessions will be conducted by the Fellows of the Society and guests whose names will be announced later. A banquet will be held on the evening of October 26th and on the afternoon of the next day (Saturday) McGill plays the University of Western Ontario at football. The first Convention of this kind, held last year, was conspicuously successful, so much so that it was decided to make it an annual event. All practitioners living in Ontario, Quebec, and the bordering United States are specially invited.

Saskatchewan

The Honourable H. E. Munroe, Lieutenant-Governor of Saskatchewan, was among the list of distinguished Canadians who received the honorary degree of LL.D. at McGill University convocation in May last.

Dr. Munroe has held the post of Lieutenant-Governor of Saskatchewan since March 31, 1930. He is a native of Glengarry County, Ont. He graduated from McGill in 1903, and has the L.R.C.P. & S., Edinburgh, also his F.A.C.S. He has studied at the Royal Infirmary, Edinburgh, the University College Hospital, and St. Bartholomew's Hospital, London, England.

One of the founders of the city of Saskatoon, Dr. Munroe served overseas, was mentioned three times in despatches and awarded the Order of the British Empire. He was raised to the rank of lieutenant-colonel while serving in the Dardanelles campaign in 1916.

LILLIAN A. CHASE

United States

The Seventh Annual Graduate Fortnight of the New York Academy of Medicine.—The Seventh Annual Graduate Fortnight of the New York Academy of Medicine will be devoted to a consideration of gastrointestinal diseases. The Fortnight will be held October 22nd to November 2nd.

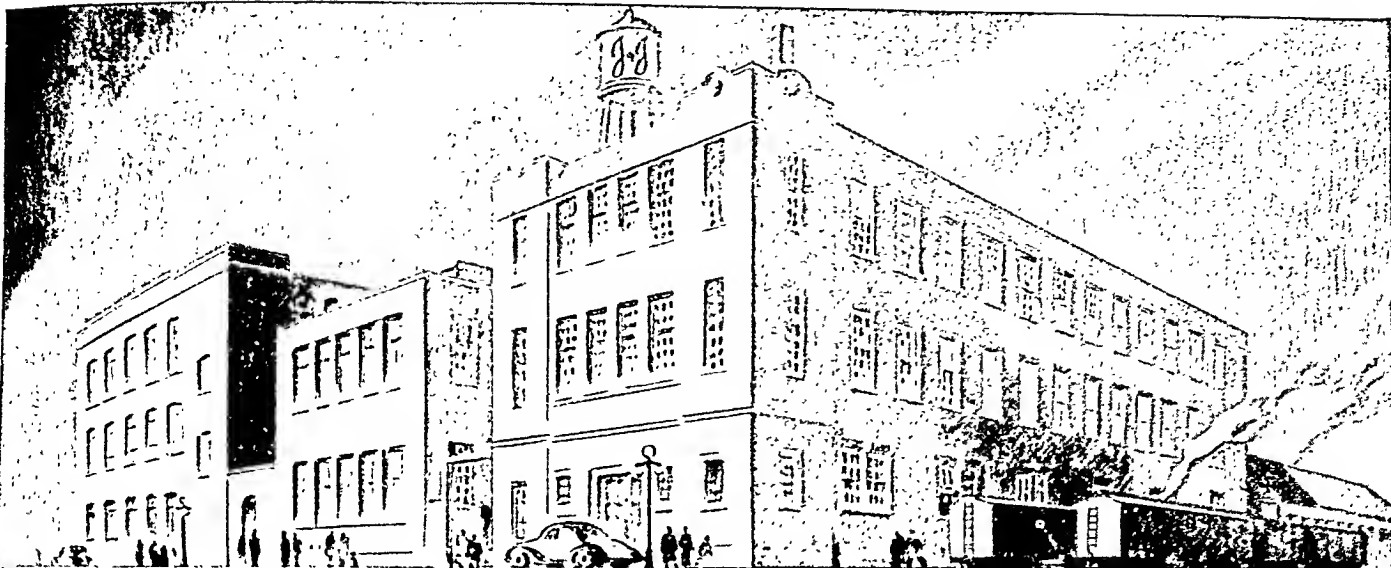
Sixteen important hospitals of the city will present co-ordinated afternoon clinics and clinical demonstrations. At the evening meetings prominent clinicians from various parts of the country who are recognised authorities in their special lines of work will discuss the various aspects of the general subject.

A comprehensive exhibit of anatomical, bacteriological and pathological specimens and research material will be shown. Many of the exhibits will be demonstrated.

Among the subjects to be presented at the evening meetings and in the hospital programs will be: general principles involved in the diagnosis of gastrointestinal diseases—medical, surgical, roentgenological; constipation; diarrhoea; physiology of the gastrointestinal tract; diseases of the pancreas, especially acute pancreatitis and its treatment; diseases of the œsophagus; functional diseases of the stomach; disorders of the gastrointestinal tract in children—infections, management, surgery in infants and children; diet in relation to gastrointestinal diseases in infancy; clinical examination of the patient from the surgeons' and the internists' points of view; demonstrations of diets used in treatment; peptic ulcer—medical discussion—surgical discussion; carcinoma of the stomach; chronic lesions in the paracœcal region; acute appendicitis; peritonitis; gall-bladder and biliary passages—medical discussion—surgical discussion; jaundice; tumours of the colon; diseases of the rectum, including tumours; intestinal obstruction; diverticulitis; colitis, amœbiasis, functional disturbances of the colon including mucous colitis; Hirschsprung's disease; lymphogranulomata; clinical methods and differential diagnosis; technique of the gastrointestinal series; laboratory examinations.

The profession generally is invited to attend. A complete program and registration blank may be secured by addressing: Dr. Frederick P. Reynolds, the New York Academy of Medicine, 2 East 103rd Street, New York City.

The Legion Award Citation to William and Charles Mayo.—The citation by the American Legion of Drs. William J. and Charles H. Mayo for distinguished public service, with the award made by the President of the United States in person, is a great honour for American medicine. It has been said that opportunities and great occasions make men. An exception to this rule is presented in the work and life of these distinguished medical leaders. They have made a small village one of the notable medical centres of the world wholly through a genius for surgery and for medical leadership. Throughout their careers they have devoted themselves to the advancement of organized medicine. The medical society of the county in which they practice was founded by their father. Both have been presidents of the American Medical Association. In 1906, when Dr. William J. Mayo delivered his presidential address to the American Medical Association, he forecast and considered some of the hazards that concern medical practice today. He attacked the abuse of medical care by public service corporations, and the abuses of public charity and of private institutions by those able to pay, and he condemned all systems of hospital and medical care dominated by laymen. He concluded his address with a plea for harmony in the medical profession, recognizing that only a strongly united opinion could gain for medicine the place in our civilization which it merits.—*J. Am. M. Ass.*



A CANADIAN INSTITUTION

AT YOUR SERVICE

2

THROUGH ethical trade practices and exacting standards of quality the name of Johnson & Johnson Limited has become known and respected throughout the Canadian Medical Profession.

Their extensive plant in Montreal (illustrated above) is the largest and most modern of its type in Canada. Here, Surgical Dressings, Bandages, Adhesive Plaster and other Hospital and Medical Supplies are manufactured under ideal conditions with rigid Laboratory supervision.

The name of Johnson & Johnson Limited on any product justifies your implicit confidence.

2

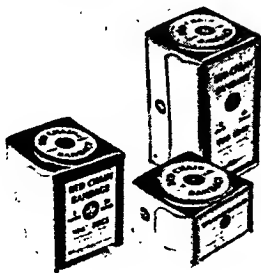
Johnson & Johnson Limited
MONTREAL CANADA



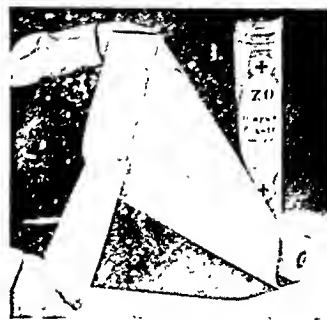
"ZO" Adhesive Plaster



Absorbent Cotton



Gauze Bandages



"ZO" Hospital Rolls



"ZO" Hand rack



K-Y Jelly

WORLD'S LARGEST MAKERS OF SURGICAL DRESSINGS, BANDAGES, ABSORBENT ETC.

Book Reviews

Intercortical Systems of the Human Cerebrum.

Joshua Rosett, Assistant Professor of Neurology, Columbia University. 135 pages, illustrated. Price \$3.00. Columbia University Press, New York, 1933.

As the title indicates this is a monograph dealing with the intricate problem of the subcortical and intercortical fibre-connections of the human cerebral cortex. The approach to this study has been made with the aid of a new and ingenious technique for the display of these short and complicated pathways. A description of the technique for the complete preparation of specimens for study is given in detail in the second chapter. To the novice the technique appears rather difficult and tedious, but in the hands of the author it has yielded further convincing information regarding these tracts and, incidentally, cerebral fissuration. The sixth to the thirteenth chapters, inclusive, contain in turn brief accounts of the intercortical systems as found with the author's technique in the various areas of the cortex, and many findings are of interest. Chapters three, four and five, introductory in character, are very brief, discussing questions in respect to the limitations of the technique and the author's views regarding the cell origin of the intercortical systems in general, and an explanation concerning annectant convolutions. The author felt it premature in the present work, however, to attempt a correlation of "the course and direction of any of the numerous intercortical pathways mapped out with any of the cortical cell areas delineated by any of the investigators of that subject." The final chapter is principally a discussion of the general pattern of the subcortical pathways of the fissures, and an hypothesis is propounded with regard to the cause of fissuration built on the new observations of the present work, which, in the light of the authoritative literature there reviewed, is very plausible.

This has been a painstaking work and the author deserves credit. The text is, for the most part, clearly written. The volume is not a textbook, and is of interest and of practical importance to those particularly interested in this special part of neuroanatomy and of neurophysiology. It should broaden the viewpoint of those interested in neurology, epilepsy and psychology.

[NOTE: This corrected review replaces the one which appeared in the July issue of the *Journal*, p. 116.]

Operative Gynecology. Dr. H. v. Peham, Privy Counsellor, Prof. of Obstetrics and Gynecology, and Dr. J. Amreich, Privat-dozent for Obstetrics and Gynecology, of University of Vienna. 779 pages, illustrated. Price \$26.00 (2 vols.). J. B. Lippincott, Philadelphia, Montreal and London, 1934.

This monumental work by the late Dr. H. v. Peham and his former assistant, Dr. J. Amreich, is now made available to a wider circle of readers by the enterprise of the J. B. Lippincott Company. The translation into English has been well done by Dr. L. Kraeer Ferguson, Associate in Surgery at the University of Pennsylvania. It is difficult to speak of this work other than in superlative terms, so thorough, full, and explicit is it. Indeed its very thoroughness and fullness lay it open to the charge of being verbose, but every good teacher knows the value of iteration and reiteration, sometimes even of the apparently obvious. The senior intern looking forward to gynecology as a career will be fortunate if he is in possession of this book, while the gynecological specialist will find much to interest and instruct him in the clear and precise teaching of v. Peham which embodies the results of much original anatomical, clinical and operative research. The 467 illustrations, mostly in colour, are beyond praise. Almost all of them are original and are the work of the artist, Karl

Hajek. Those of the special part were nearly all drawn from life at actual operations.

Part I of the first volume deals with General Principles, Anæsthesia (particularly local anæsthesia), Post-operative Complications and their Prevention, Incisions and Pre- and Post-operative Treatment. Part II, dealing with gynecological anatomy, is particularly good and will appeal to the professional anatomist as well as to the gynecologist. The second volume treats of the operative treatment of gynecological diseases. The various steps of operative procedure, pictured with a wealth of illustrations, appeal to the eye, and the insistence of the authors of the importance of the anatomical basis of operations leaves on the mind of the reader an impression that these operations have been evolved by a process of logical and orderly thinking. The place and value of irradiation in the therapy of carcinoma, functional uterine bleeding, and myoma are discussed.

The Dermatogoses or Occupational Affections of the Skin. R. Prosser White, M.D., M.B., C.M. Ed., M.R.C.S., Late President, the Certifying Factory Surgeons' Association. Fourth edition, 716 pages, illustrated. Price 35/- net. H. K. Lewis, London, 1934.

The complexity of modern living conditions is well indicated by the variety of occupational diseases. The present book is concerned with only a portion of these, namely, those affecting the skin. To describe these Dr. White coined the term "dermatogoses" (literally, skin diseases from work), for as he points out some word must be found to cover not only eczemas, (which Unna used in several occupational disorders) but dermal conditions from microbic, traumatic, toxic, allergic, idiopathic and psychopathic sources. There are hypertrophies and atrophies; friction effects; plant eczemas; folliculitis from pitch, tar, paraffin and oil; warts, cancers, granulomata, etc. A single agent, such as chrome, or lime, may produce changes varying from a pale pink erythema to a pulsating sore, from a deep crack to a deep hole.

Armed with this comprehensive term Dr. White proceeds to assemble a most extraordinary collection of facts and writings relating to cutaneous disorders due to occupation. There is no industry, no occupation, no substance, which may not cause trouble; from tramps with their parasite attendants, to workers in the most hazardous trades; from water, to the obvious and deadly chemicals. Truly did Dr. James remark in 1746, "Every sick person should be asked by his physician what trade is he of?"

But this is more than a collection of isolated statements. Dr. White's own experience was vast, and he has brought it all to bear on his subject. It is remarkable to find how widely the book ranges. It is quite out of the question to leave these dermatogoses to the dermatologist alone. They are too closely related to questions of sensitivity, of general tissue response to injury, and in their widest application of all, to problems of public health.

This edition was only just completed by Dr. White before his death. It stands as a worthy monument to his outstanding industry and ability.

Sterilization? Birth Control? A Book for Family Welfare and Safety. Helen MacMurchy, C.B.E., M.D. 156 pages. Price \$1.50. Macmillan Co. of Canada, Toronto, 1934.

Doctor Helen MacMurchy is well and favourably known to the public and to the medical profession of Canada. Believing that there was a need for a compiled summary of authoritative views on the subjects of sterilization and birth control, she has proceeded to meet this need by the preparation of a volume which, in a very satisfactory manner, accomplishes the purpose.

Ten citizens out of every thousand are unable to care for themselves; three, because they are mentally

Acute and Generalized Staphylococcal Infections

Staphylococcus Antitoxin

From various sources there has been an accumulation of evidence which suggests that much of the symptomatology of acute staphylococcal infections is attributable to liberation of staphylococcus exotoxin within the body. The serious nature of such infections would appear to be due in large measure to the highly pathogenic effects of staphylococcus exotoxin upon living cells and tissues. Consequently, the use of staphylococcus antitoxin has been advocated in the treatment of acute and of generalized infections where there is evidence that *Staphylococcus pyogenes* is the causal micro-organism. (See the issues of this Journal for June, July and August, 1934.)

As prepared by methods evolved in the Connaught Laboratories, Staphylococcus Antitoxin consists of refined and concentrated globulins from the blood-serum of horses which have been immunized against pooled toxoids and toxins of several selected strains of staphylococcus. Beneficial results have followed administration of this antitoxin in ACUTE CARBUNCLE and in CELLULITIS, OSTEOMYELITIS, MENINGITIS and SEPTICAEMIA, where staphylococcus has been the infecting agent.

Staphylococcus Antitoxin (Refined and Concentrated) has been made available by the Connaught Laboratories in 25 cc. vial-packages.



*Prices and information relating to
the use of Staphylococcus Antitoxin
will be supplied gladly upon request.*



CONNAUGHT LABORATORIES
University of Toronto

TORONTO 5

CANADA

defective, and another three because of mental illness. This statement leads the author to ask: "How long is it possible for any nation to last when the normal stream of national life is polluted at its source by feeble-minded who increase in double or treble the ratio of the normal?" The book is not propaganda. There are statements of fact, dealing with such subjects as legislation and methods of sterilization. Doctor MacMurchy has succeeded in presenting the subject in all its aspects, as viewed by those authorities who are far apart in their conclusions, and so the reader learns both sides of the controversy. The Encyclical Letter of Pius XI on *Christian Marriage*, is quoted, which expresses disapproval of sterilization, as well as the Report of the Departmental Committee (Broek Committee) of 1934, which approves sterilization as the only certain method of preventing procreation. As to birth control, the book emphasizes that there is no certain means known to prevent conception if sexual intercourse occurs.

Doctor MacMurchy's views on sterilization are against compulsory action, but she is favourable to voluntary sterilization with adequate safeguards, keeping in mind that segregation in institutions will always be necessary for a large number of cases. Birth control should not, in the author's opinion, be undertaken except for definite medical reasons, and yet, there are cases needing counsel, for whom help in the way of instruction concerning birth control should be given.

The reader will be surprised to find how much solid material is packed into this small volume, which in itself is an adequate presentation, and for those who may wish to read more, the references of sources will be of value. This book is recommended without hesitation to all who have interest in the subject.

Survey of Public Health Nursing. By the National Organization for Public Health Nursing. Katharine Tucker, General Director. 262 pages. Price \$2.00. Commonwealth Fund, New York, 1934.

The foreword by Livingston Farrand explains the survey in these words: "It is a commonplace in the commercial world that an inventory of stock is essential to profitable operation. . . . In other words, devotion and enthusiasm can never be safely relied upon as substitutes for an accurate knowledge of values."

There are approximately 5,000 organizations in the United States employing nearly 20,000 nurses giving public health nursing service. The National Organization for Public Health Nursing, organized in 1912, promoted this self-survey to answer certain questions covering standards of service, the adequacy of these standards, to what extent they are put into practice, the whys and wherefores of variations from the standard. Twenty-eight cities, towns and counties were selected and studied as being representative of the whole country. It was found that public health nursing is administered by two official bodies—departments of health and boards of education—and by non-official bodies. The former are fewer in number, but employ the larger number of nurses. The Committee advocate that, for the immediate future, a standard of two agencies, one official and one non-official, should be accepted. The ratio of public health nurse to population is usually 1 to 3,000 or 4,000. The distribution has no relationship to need or capacity to support. Only one-third of the nurses have had any theoretical preparation through post-graduate courses, and only 7 per cent have completed an accredited public health nursing course. The preparation of nurses for public health work is a major problem, and the Committee consider, as a major recommendation, that all public health nursing agencies should provide facilities for educational supervision and for a continuous staff educational program. It is also advised that all schools of nursing incorporate the fundamental theory and experience essential for the building of further public

health nursing preparation. As to quality of service, the educational services are weakest, due likely to lack of preparation, for, as the survey points out, good educational service cannot be looked for unless the nurse knows what and how to teach.

There are practical suggestions concerning organization, the rotation of officers to avoid static control, better cooperation with the local medical society and other local organizations. All told, the report is an honest review of conditions that exist, with a frank facing of deficiencies and courageous planning for the future. From this and other surveys, it appears that the nursing profession has a firm belief in the value of self-analysis, and is not at all afraid to allow others to know the facts. It is from such constructive work that results may be looked for with assurance.

Chronic Nasal Sinusitis and Its Relation to General Medicine. Patrick Watson-Williams, Hon. Consulting Surgeon in Diseases of Ear, Nose and Throat, Bristol Royal Infirmary. Second edition, 262 pages, illustrated. Price \$4.50. John Wright & Sons, Bristol; Macmillan Co., Toronto, 1933.

This book is not a textbook on the diseases of the nasal accessory sinuses so much as a discussion of nasal accessory sinus disease in medical conditions. The descriptions of various radical operative proceedings, ordinary methods of examination, anatomical description, and special methods are omitted.

The novice will be much intrigued by the amazingly hopeful prognosis he will be tempted to give in many chronic ailments. The paragraph on the futility of indiscriminate operation consists of a dozen lines only. It would have enhanced the usefulness of the book to have directed the same number of pages to the subject. The book is particularly useful in that it draws special attention to some refinements of nasal examination and diagnosis. It should be read by all senior students in otolaryngology, and by internists with a broad background of experience. Dr. Watson-Williams' enthusiasm for his subject, really his life study, has gained for him a high place in the study of disease of the accessory sinuses. If he has been carried away a little, and has placed accessory sinus sepsis (without occult pus), too prominently in the etiology of many obscure cases in general medicine, it is only a natural error and one readily forgiven.

Clinical Studies on the Physiology of the Eye. J. Grandson Byrne, M.A., M.D. 144 pages, illustrated. Price 10s. 6d. H. K. Lewis, London, 1934.

This book consists in part of a summary of recent work by the same author entitled "Studies on the Physiology of the Eye" and in part an application of his theory of the mechanisms governing palpebral, pupillary and lenticular movements to explain various clinical conditions. Chapters 1 to 8 summarize his earlier work. Chapter 10 deals with the mechanism of the Argyll-Robertson pupil, where he quotes earlier workers who found lesions (1) between the optic tract and the constrictor centre; (2) in the ciliary ganglion; (3) in the cervical spinal cord; and (4) in the cervical sympathetic nerve, and then states that various types of the Argyll-Robertson pupil are found, which vary in size and shape and which show paradoxical dilatation or constriction or pseudoparadoxical dilatation in a positive or negative phase. These variations, according to Byrne, prove that lesions in (1) involve the afferent dilator and constrictor paths; in (2) the efferent constrictor paths; in (3) the afferent constrictor paths; and in (4) the efferent dilator paths. In support of these views he mentions that retinal illumination always elicits a preliminary dilatation of the pupil, and that there is no such thing as accommodation without convergence. The book ends with a chapter on the treatment of the disorders of accommodation, in which he states that too many

"PEGGING" Your Income!



The professional man — doctor, lawyer, engineer, clergyman — has a different problem from that of his commercial brother. His chief assets are his ability and experience. These are revenue-producing only while he lives. They die with him or become inactive when he retires.

Life insurance gives him the privilege of perpetuating the revenue from his profession for any amount or period he chooses. He can prolong his income far beyond his productive years. He can "peg" a regular income for his own old age. Or he can definitely fix it for his dependants. And he can liquidate the cost of doing so during the income-producing years when such payments entail little or no sacrifice.

A Sun Life representative will be glad to draw up a plan suited to your own individual requirements upon request.

SUN LIFE ASSURANCE COMPANY OF CANADA
Head Office . . . **Montreal**

U R A S A L

AN EFFICIENT

URINARY ANTISEPTIC

COMPOSITION:

Hexamethylenamine 7½ grs.
 combined with Piperazin and
 Lithia Benzo-Citrate.

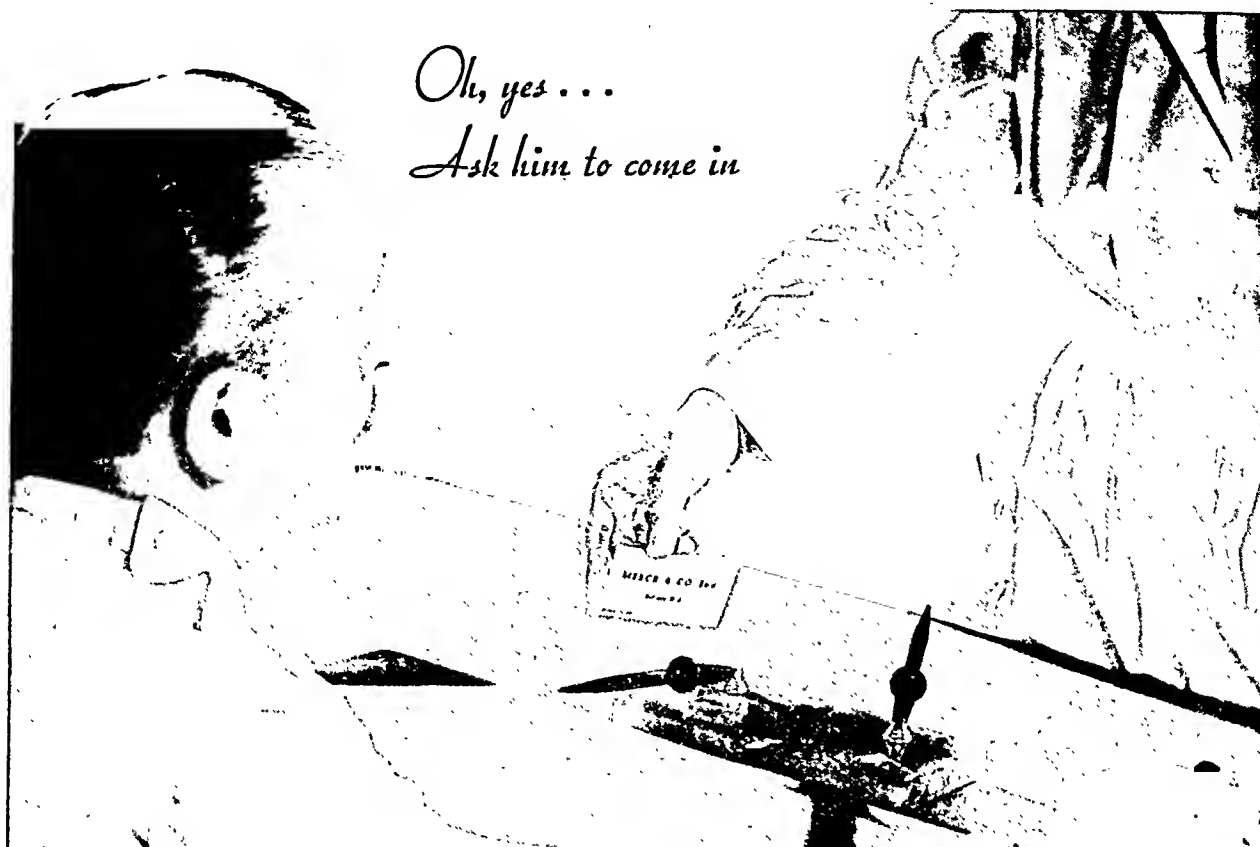
INDICATIONS:

CYSTITIS - PYELITIS
 RHEUMATISM, Etc.

A Liberal Sample mailed to Physicians upon request.

Manufactured by

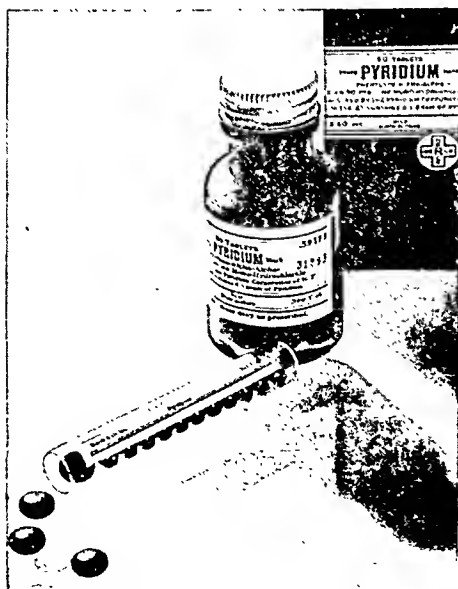
FRANK W. HORNER LIMITED
MONTREAL - - CANADA



TRADE **PYRIDIUM** MARK

PHENYLazo-ALPHA-ALPHA-DIAMINO-PYRIDINE MONO-HYDROCHLORIDE, MFD. BY PYRIDIUM CORP., N. Y.

"Good afternoon doctor . . . are you prescribing Pyridium?"



IN CASE you have never given Pyridium a trial, may we suggest that you do not delay further in taking advantage of its usefulness. It is very valuable for the alleviation of the distressing symptoms that often accompany genito-urinary infections, as well as in the treatment of these infections.

MERCK & CO. LTD.
MANUFACTURING CHEMISTS
MONTREAL

**MILD
SOLUTION OF
SALT
EFFECTIVE AND
SAFE FOR
ORAL HYGIENE**



Many users of salt for the daily mouthwash employ an over-strong solution. Scientific research and laboratory experiment has demonstrated that half a teaspoon of salt to the glass of water will dissolve mucus and carry away the bacteria contained in it.

This mild solution is agreeable to the taste; tones up the mucus membrane and leaves the mouth pleasantly invigorated.

Windsor Salt, as a dentifrice, cleans and whitens the teeth without scratching the enamel; it firms the gums and maintains them in healthy condition.



On request we will gladly send booklet "Oral Health"

WINDSOR SALT BEING MILD AND INVARIABLY PURE, IS PLEASANT TO USE.

WINDSOR SALT

"Purest and Best" for Oral Hygiene

**CANADIAN INDUSTRIES LIMITED
WINDSOR SALT SECTION, WINDSOR, ONTARIO**

AUTUMNAL CATARRH (HAY FEVER) NEW VASO-CONSTRICTIVE AGENT BRINGS PROMPT, PROLONGED RELIEF

Regardless of attempts at abortive treatment—desensitization, change of climate, etc.—your first consideration will be to provide patient comfort—quick, prolonged relief—from the intolerable congestion, lacrimation, sneezing.

NEO-SYNEPHRIN HYDROCHLORIDE

(levo-meta-methylaminoethanolphenol hydrochloride)

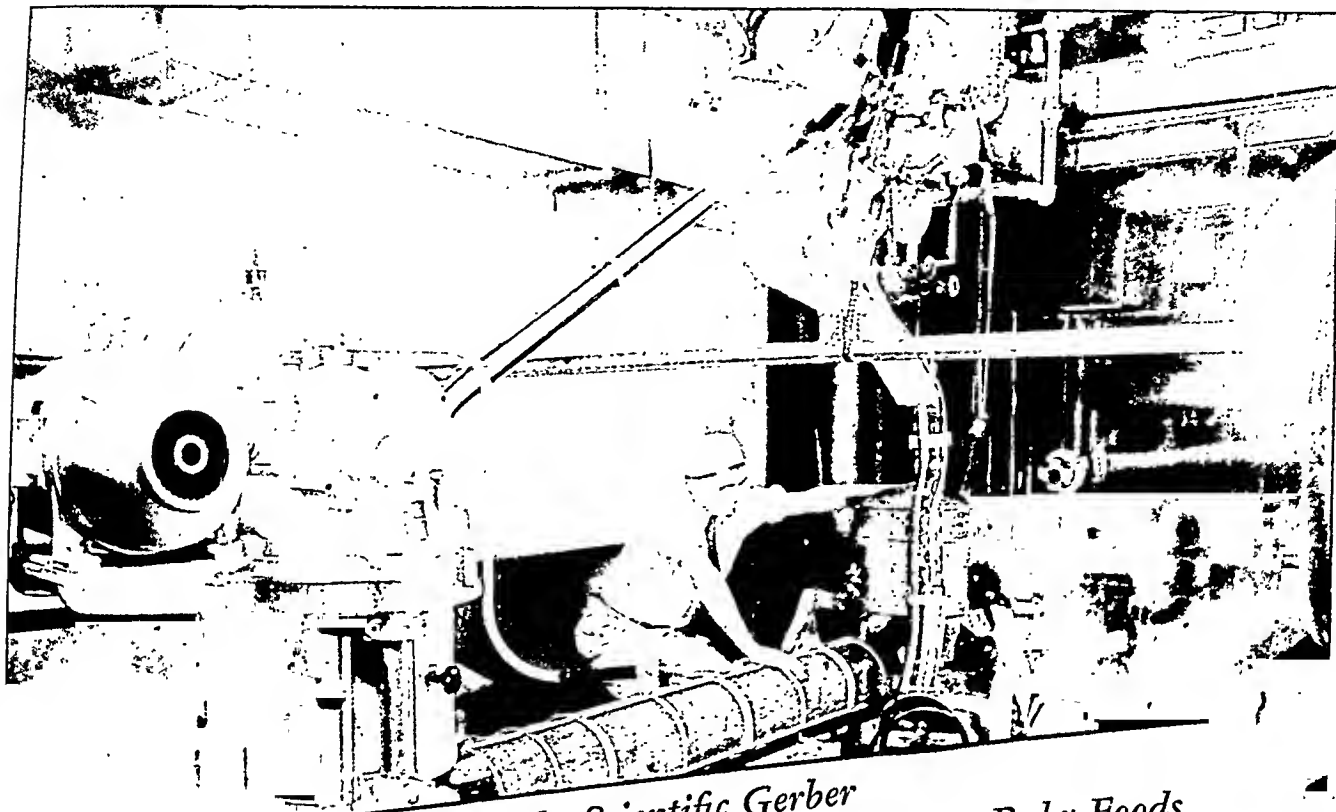
This most recent advance in the field of vaso-constrictive agents has been found to possess the following advantages:

1. Less toxic in therapeutic doses than epinephrine or ephedrine.
2. Action more sustained than epinephrine.
3. Active each time it is given.
4. Without sting.
5. Untoward systemic symptoms diminished.

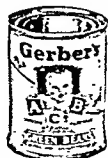
Neo-Synephrin Hydrochloride acts by contracting the musculature of the capillaries and arterioles. The effect occurs usually without nervousness, insomnia or other untoward symptoms.

**FREDERICK STEARNS & CO. OF CANADA, LIMITED
WINDSOR, ONTARIO**

Packed in Steam-Washed Cans by Steam-Washed Equipment



*Step number four in the Scientific Gerber
Process of Safeguarding Baby Foods*



AFTER each Gerber product has passed through the Gerber monel metal strainers that remove coarse fibre and give each product its smooth, finely subdivided consistency—the product is conveyed to the Gerber vacuum pans for accurate moisture regulation. The product then flows by gravity to the filling machines through monel metal tubes. Each can is thoroughly steam-washed, *automatically* inverted and shaken before being filled.

The capping machines seal the filled cans *hermetically*, and they are then conveyed to the steam-pressure retorts where each Gerber product is cooked at the exact temperature and for the exact length

of time predetermined as most desirable for each individual product.

The high degree of heat penetration permitted by the tin container insures, in the cooking process, a degree of sterilization sufficient to destroy all harmful bacteria. Vitamins are conserved in high degree through the exclusion of oxygen throughout the Gerber steaming and cooking processes—another reason for the statement "Gerber's are Better for Baby."

Gerber's

9 Strained Foods for Baby

FINE FOODS OF CANADA, LTD., WINDSOR, ONTARIO

Please send me ☐ Reprint of the article, "The Nutritive Value of Strained Vegetables in Infant Feeding." ☐ Sample can of Gerber's Strained Cereal.

Name..... Address.....

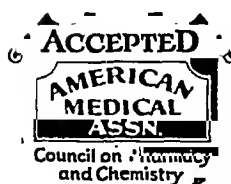
City..... Province.....

Strained Tomatoes . . . Green Beans . . .
Beets . . . Vegetable Soup . . . Carrots
. . . Prunes . . . Spinach . . . Peas . . .
4½-oz. cans. Strained Cereal 10¼-oz. cans.

ARTHRITIS OBESITY ARTERIO - SCLEROSIS

When the administration of iodine is indicated in these conditions, the treatment being necessarily a prolonged one, a form of iodine therapy is desired that may be administered, for months at a time if necessary, without toxic effect.

RIODINE (Astier)



With Riodine (Astier), which is a 66% solution in oil of an iodine addition product of castor oil having an iodine content of 17% of its total weight, iodine medication may be

administered over long periods with little fear of gastrointestinal or other iodine disturbances.

Riodine is marketed in pearls. There is no spilling, no measuring, no bad taste.

Dosage, 2 to 6 pearls daily, after meals.

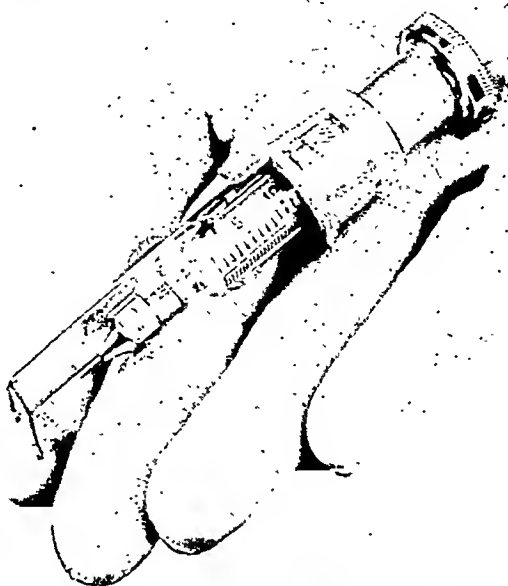
Write for Literature and Sample.

ROUGIER FRÈRES

Canadian Distributors

350 Le Moyne Street - Montreal

INSULIN PATIENTS WELCOME



The B-D BUSHE AUTOMATIC INJECTO

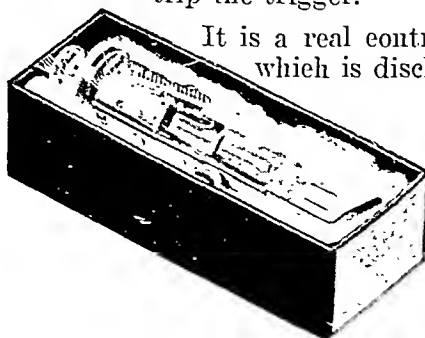
It practically eliminates the pain of injection

The needle penetrates at the right depth and angle. Nervousness and uncertainty disappear.

The B-D Busher Automatic Injector is simple in construction — and durable. It holds B-short type insulin syringes.

Just load the syringe, cock the injector and trip the trigger.

It is a real contribution, the merit of which is disclosed with use.



Available with or without the B-D Yale Syringe.

B-D PRODUCTS
Made for the Profession

BECTON, DICKINSON & CO.
RUTHERFORD, N. J.

LIKE BREAST MILK

S. M. A., when diluted according to directions, is essentially similar to human milk in percentages of protein, fat, carbohydrates and ash, in chemical constants of the fat and in physical properties. « Adaptation of the fats is an essential difference between S. M. A. and other systems of feeding normal infants.

*S. M. A. the antirachitic and
antispasmodic breast milk adaptation*

S. M. A. is a food for infants — derived from tuberculin tested cows' milk, the fat of which is replaced by animal and vegetable fats including biologically tested cod liver oil; with the addition of milk sugar, potassium chloride and salts; altogether forming an antirachitic food. When diluted according to directions, it is essentially similar to human milk in percentages of protein, fat, carbohydrates and ash, in chemical constants of the fat and in physical properties.

For samples simply attach this line to your letterhead

W. LLOYD WOOD, Limited  64-66 Gerrard St., East, Toronto

Canadian Distributors for S. M. A. Corporation

The Canadian Medical Protective Association

PRESIDENT - R. W. POWELL, M.D., F.A.C.S.

Founded in 1901, at the Winnipeg meeting of the Canadian Medical Association, incorporated by Act of Dominion Parliament, February 1913, and affiliated with the Canadian Medical Association 1924.

Objects:—

To defend its members against cases of alleged malpractice, and to encourage honourable practice in the daily work of the medical profession. The annual fee is five dollars per calendar year, half-rates after July first.

Subject to our by-laws the taxable costs of actions together with reasonable counsel and witness fees are paid in cases undertaken by our Association, as well as damages if awarded. All members in good standing of the Canadian and various Provincial Medical Associations, may be enrolled upon signing the application form and paying the annual fee. All other regularly qualified practitioners must have their application countersigned by two members of our Association. Blank application forms and other literature upon request.

Address all correspondence to the Secretary-Treasurer

J. FENTON ARGUE, M.D., Secretary-Treasurer, 116 Nepean Street, Ottawa, Canada

CHARLES B. TOWNS HOSPITAL

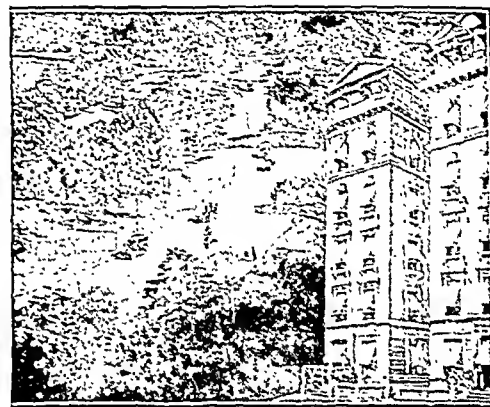
293 Central Park West

New York, New York

For ALCOHOLISM and DRUG ADDICTION

ANY
PHYSICIAN
having an ad-
dict problem is
invited to write
for "Hospital
Treatment for
Alcohol and
Drug Addic-
tion."

This institution has specialized in addictions for over 30 years. Its method of treatment has been fully described in THE JOURNAL A. M. A.; in The Handbook of Therapy, from the A. M. A. Press; and in other scientific literature. The treatment is a regular hospital procedure, and provides a definite means for eliminating the toxic products of alcohol and drugs from the tissues. A complete Department of Physical Therapy, with gymnasium and other facilities for physical rebuilding, is maintained. Operated as an "open" institution. Physicians are not only invited but urged to accompany and stay with their patients.



Located Directly
Across from Central Park

London School of Hygiene and Tropical Medicine

(University of London)
(Incorporating the Ross Institute)

Diploma in Tropical Medicine and Hygiene (Eng.)

Dates of the Courses 1934.

(Each part can be taken independently but not concurrently)

Section A. (Clinical and Laboratory Instruction—a 3-months' course). 9th April-28th June; 1st October-21st December, (and in January, 1935).

Section B. (Tropical Hygiene—a 2-months' course). 23rd April-22nd June, (and in January, 1935).

Fees (inclusive): Section A, £25; Section B, £15.

Diploma in Psychology (Industrial)
Special courses of study by arrangement.

Diploma in Public Health
Course of study (whole-time, nine months) commencing in October. Inclusive fee, 54 guineas.

Diploma in Bacteriology
Courses of study (whole-time, one academic year) commencing in October. Inclusive fee, £47, 15s.

Epidemiology and Vital Statistics
Special three-monthly advanced courses. Inclusive fee, 7 guineas.

For Prospectus and Synopses of Lectures, etc., apply to the Secretary, London School of Hygiene and Tropical Medicine, Keppel-street (Gower-Street), London, W.C.1.

Cook County Graduate School of Medicine

(IN AFFILIATION WITH COOK COUNTY HOSPITAL)

Announces continuous courses

MEDICINE—General and Intensive Courses. (Two Weeks Intensive Course starting October 22nd).

PEDIATRICS—Informal Course—Intensive Course.

EAR, NOSE and THROAT—Informal Course—Special Courses. (Two Weeks Intensive Course starting October 22nd).

SURGERY—General Course One, Two, Three and Six Months; Surgical Technique Two Weeks Intensive Course—Special Courses.

GYNECOLOGY—Three Months Course—Two Weeks Intensive Course—Special Courses.

OBSTETRICS—Informal Course—Two Weeks Intensive Course.

FRACTURES and TRAUMATIC SURGERY—Informal Course—(Intensive Course starting October 22nd).

UROLOGY—General Course Two Months—Intensive Course Two Weeks—Special Courses.

CYSTOSCOPY—Intensive Course. (Attendance limited).

General, Intensive and Special Courses in Tuberculosis, Ophthalmology, Roentgenology, Pathology, Neurology, Electrocardiography, Topographical and Surgical Anatomy, Physical Therapy, Gastroenterology, Allergy.

Teaching Faculty—Attending Staff of Cook County Hospital

Address: Registrar

427 S. Honore Street, Chicago, Illinois

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION

No. 1, Wimpole Street, London, W. 1.

with which is associated some 50 General and Special Hospitals in London, is prepared to offer the following facilities to qualified practitioners:

- I General Courses are arranged covering all branches of Medicine and Surgery. These Courses occupy the student for several hours every day and last for two weeks.
- II Rota of teachers, giving personal tuition at hospital clinics, is arranged and full details are given in a Supplement issued every month in the Journal.
- III Special Courses are arranged at the Special Hospitals associated with the Fellowship, and permit of intensive study in one specialty for a period ranging from 1 week to one month.

The Special Courses arranged for the ensuing months are:—

F.R.C.S. (Final) (Evening Courses)	(Sept. 25 to Oct. 30) (Sept. 27 to Nov. 1)	National Temperance Hospital. 8 p.m. Two separate courses on Tuesday and on Thursday evenings. Clinical and Pathological. (Maximum of 25 in each course) Fee £7. 7s. 0d. each course.
Diseases of Children	Oct. 1 to Oct. 13—Queen's Hospital. All day. Fee £3. 3s. 0d.	
Dermatology	Oct. 1 to Oct. 27—St. John's Hospital. Afternoons. Fee £1. 1s. 0d. (Practical Pathology arranged. Fee £4. 4s. 0d.)	
Physical Medicine (Evening Course)	Oct. 1 to Oct. 27—London Clinic and Institute of Physical Medicine. Three evenings a week. Fee £2. 2s. 0d.	
Cardiology	Oct. 8 to Oct. 20—National Hospital for Diseases of the Heart. All day. Fee £7. 7s. 0d. (Maximum of 20).	
Medicine, Surgery and the Specialties	Oct. 8 to Oct. 21—Metropolitan Hospital. All day. Fee £5. 5s. 0d.	
Ophthalmology	Oct. 15 to Nov. 3—Royal Westminster Ophthalmic Hospital. Afternoons. Fee £4. 4s. 0d.	
Clinical Surgery (Week-end Course)	Oct. 20 and Oct. 21—Royal Albert Dock Hospital. Saturday and Sunday. All day. Fee £2. 2s. 0d.	
Gynaecology	Oct. 22 to Nov. 3—Chelsea Hospital for Women. Mornings and/or afternoons. Fee £5. 5s. 0d.	
Diseases of the Chest (Week-end Course)	Oct. 27 and Oct. 28—Brompton Hospital. Saturday and Sunday. All day. Fee £1. 11s. 6d.	

Copies of all Special Course syllabuses and of the General Course Programme may be obtained on application. The Hospitals reserve the right to make any alterations necessary in dates and fees. Post-graduates are advised, therefore, to make early enquiry. Other courses are arranged from time to time, in addition to the above list.

Lecture Demonstrations on general medicine are given every Tuesday afternoon, and on Medicine, Surgery or one of the Specialties on the second Saturday of every month.

Courses are open only to Members of the Fellowship of Medicine; the annual subscription (from the month of joining) is £1. 1s. 0d., which includes the subscription to the Monthly *Post-Graduate Medical Journal*. Overseas subscription, to the Journal only, is 12/- per annum, post free. Every effort is made to assist Members to obtain the post-graduate work they require.

A. E. MORTIMER WOOLF, F.R.C.S.

MAURICE DAVIDSON, M.D.

Honorary Secretaries

HOMEWOOD SANITARIUM

GUELPH, ONTARIO



A private neuropsychiatric hospital with special facilities for the study of early cases to establish diagnosis and determine prophylactic or treatment indications.

75 acres of woods and lawns with ample provision for out and in-door employment and diversions.

GUELPH, reputed as one of the healthiest cities of Canada, is conveniently accessible from Toronto, Montreal, Buffalo and Detroit.

Address Dr. Harvey Clare, Medical Superintendent, Guelph, Ontario

McGill University

MONTREAL

FACULTY OF MEDICINE

C. F. Martin, B.A., M.D., C.M., LL.D., Dean

The regular five-year course of study leading to the degree of M.D., C.M., offers considerable latitude in the choice and arrangement of subjects.

Students who have taken three years of study in the faculty of Arts of McGill University may obtain the degree of B.Sc. on completion of the second year of the medical course.

Opportunities for graduate study are offered in the basic medical sciences and in the clinical fields and courses leading to the M.Sc. and Ph.D. degrees are given under the direction of the Faculty of Graduate Study and Research.

A practical course leading to the Diploma of Public Health is open to medical graduates and Public Health Officers.

Full particulars of entrance requirements, fees, curriculum, etc. are given in the Annual Announcement which may be obtained on application to

PROF. J. C. SIMPSON

Secretary of the Faculty of Medicine

THE NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America.)

TRAUMATIC SURGERY

including

General Surgery, Orthopedic Surgery, Physical Therapy, Anatomical Review and Operative Surgery on the Cadaver.

PATHOLOGY and BACTERIOLOGY

EYE, EAR, NOSE and THROAT

POST-GRADUATE INSTRUCTION
comprising
**MEDICINE, SURGERY
and ALLIED SPECIALTIES**

FOR INFORMATION ADDRESS

MEDICAL EXECUTIVE OFFICER, 345 West 50th St., New York City



Hollywood Sanitarium

New Westminster, British Columbia

For the treatment of Nervous, Alcoholic, Toxic, Neurologic and Psychopathic cases exclusively.

Reference: B.C. Medical Association

Write for prospectus and rates to the
Medical Superintendent.

POST GRADUATE STUDY

For Canadian and American Practitioners

Clinical and practical instruction, either individual or in small classes, on the lines of the Vienna Post-graduate Clinic Courses in the following specialities can be arranged.—

Cystoscopy and Urethroscopy, Ureteral Catheterisation. Proctoscopy and Sigmoidoscopy. Radium Therapy. Fluoroscopy and X-Ray diagnosis. Diathermy. Electrocardiography. Pathological Histology of the Nervous System for D.P.M. candidates. Psychotherapy and Psychoanalysis.

Postal, oral, clinical, and practical coaching for all the higher Medical Examinations can be commenced at any time. Preparation of M.D. Theses for all Universities, M.R.C.P., F.R.C.S. and the various special diplomas.

Post coupon for
full details of
any Course.

THE SECRETARY
MEDICAL
CORRESPONDENCE
COLLEGE

19 Welbeck Street,
Cavendish Square, London, W.1.

Sir,—Please send me a copy of your
"Guide to Medical Examinations" and de-
tails of Post-graduate Courses, by return.

Name

Address

Course in which interested

C.M.A.



LAKE EDWARD SANATORIUM

Lake Edward, P. Que.

Built on the shores of beautiful Lake Edward, this Sanatorium is fully equipped for the scientific treatment of pulmonary tuberculosis. Private and semi-private rooms only. Rates moderate. Excellent cuisine. Direct service by Canadian National Railways, both from Montreal and Quebec. Saranac-trained medical staff.

For information, address

DOCTOR J.-A. COUILLARD, B.A., L.Ph., Medical Superintendent

LAKE EDWARD SANATORIUM

Lake Edward, P. Que.

WOOD SANATORIUM

FOR THE TREATMENT
OF ADDICTION TO ALCOHOL

The treatment administered by Wood Sanatorium, opened 1931, establishes systemic incompatibility with alcohol, builds up and regulates organic functions and renders patients free from all desire for alcoholic stimulant.

Wood Sanatorium is regularly registered and inspected by Ontario Department of Health. All treatment under strict medical supervision, and nursing attendance. Complete facilities and commodious accommodations.

Medical practitioners are requested to make personal investigation and enquiry. Complete information freely given.

GEO. R. WOOD, Phm.C.
Superintendent

CLAREMONT

121 Emerald Street South
Hamilton - Ontario



INTERNATIONAL MEDICAL ASSEMBLY

Inter-State Postgraduate Medical Association of North America
Public Auditorium, Philadelphia, Pa. NOVEMBER 5-6-7-8-9, 1934



Pre-Assembly Clinics, November 3rd; Post-Assembly Clinics, November 10th, Philadelphia Hospitals.
President, Dr. John M. T. Finney, President-Elect, Dr. Charles H. Mayo,
Chairman Program Committee, Dr. George Crile, Managing-Director, Dr. William B. Peck,
Secretary, Dr. Tom B. Throckmorton, Director of Exhibits, Dr. Arthur G. Sullivan
ALL MEDICAL MEN AND WOMEN IN GOOD STANDING CORDIALLY INVITED

Intensive Clinical and Didactic Program by World Authorities

The following is a major list of members of the profession who will take part on the program:

Alfred W. Adson, Rochester, Minn.
Charles R. Austrian, Baltimore, Md.
W. Wayne Babcock, Philadelphia, Pa.
Lewellyn F. Barker, Baltimore, Md.
Edward L. Bauer, Philadelphia, Pa.
Arthur Dean Bevan, Chicago, Ill.
P. Broake Bland, Philadelphia, Pa.
Harlow Brooks, New York, N.Y.
Ralph C. Brown, Chicago, Ill.
Hugh Cabot, Rochester, Minn.
James T. Case, Chicago, Ill.
R. B. Cattell, Boston, Mass.
Henry A. Christian, Boston, Mass.
George Crile, Cleveland, Ohio.
Elliott C. Cutler, Boston, Mass.
Walter E. Dandy, Baltimore, Md.
Vernan C. David, Chicago, Ill.
John F. Erdmann, New York, N.Y.
John M. T. Finney, Baltimore, Md.
John R. Fraser, Montreal, Canada.
Charles H. Frazier, Philadelphia, Pa.
J. Claxton Gittings, Philadelphia, Pa.
Rass Golden, New York, N.Y.
Perry G. Goldsmith, Toronto, Canada.
Evarts A. Graham, St. Louis, Mo.
Rascoe R. Graham, Toronto, Canada.
R. L. Haden, Cleveland, Ohio.
William D. Haggard, Nashville, Tenn.
George J. Heuer, New York, N.Y.
Emile F. Holman, San Francisco, Cal.
Campbell P. Howard, Montreal, Canada.
Chevalier L. Jackson, Philadelphia, Pa.

Elliott P. Joslin, Boston, Mass.
E. Starr Judd, Rochester, Minn.
Frederick J. Kalteyer, Philadelphia, Pa.
Louis J. Karnosh, Cleveland, Ohio.
Floyd E. Keene, Philadelphia, Pa.
Edward J. Klopp, Philadelphia, Pa.
Frank C. Knowles, Philadelphia, Pa.
John A. Kolmer, Philadelphia, Pa.
Frank H. Lahey, Boston, Mass.
Dean Lewis, Baltimore, Md.
Fielding O. Lewis, Philadelphia, Pa.
Warfield T. Longcope, Baltimore, Md.
William E. Lowe, Cleveland, Ohio.
William P. Lucas, San Francisco, Cal.
Willis F. Manges, Philadelphia, Pa.
Charles H. Mayo, Rochester, Minn.
William J. Mayo, Rochester, Minn.
Joseph F. McCarthy, New York, N.Y.
James H. Means, Boston, Mass.
George B. Minot, Boston, Mass.
John J. Moorhead, New York, N.Y.
George P. Muller, Philadelphia, Pa.
Emil Novak, Baltimore, Md.
Robert B. Osgood, Boston, Mass.
Ralph Pemberton, Philadelphia, Pa.
O. H. Perry Pepper, Philadelphia, Pa.
William C. Quinby, Boston, Mass.
Fred W. Rankin, Lexington, Ky.
William F. Rienhoff, Jr., Baltimore, Md.
David Riesman, Philadelphia, Pa.
Leonard G. Rowntree, Philadelphia, Pa.
Alfred Stengel, Philadelphia, Pa.

Cyrus C. Sturgis, Ann Arbor, Mich.
Robert G. Torrey, Philadelphia, Pa.
Waltman Walters, Rochester, Minn.
John M. Wheeler, New York, N.Y.
Allen O. Whipple, New York, N.Y.
Hugh H. Young, Baltimore, Md.

FOREIGN ACCEPTANCES TO DATE

Dr. Roberto Alessandri, Prof. of Clinical Surgery, Medical Dept., Royal University of Rome, Rome, Italy.
Dr. A. Mario Dogliotti, Prof. of Clinical Pathology, Royal University of Turin, Turin, Italy.
Sir Harold Gillies, London, England.
Dr. Hans Guggisberg, Prof. of Gynecology, University of Berne, Berne, Switzerland.
Dr. Paul Strassmann, Prof. of Obstetrics and Gynecology, University of Berlin, Berlin, Germany.

TENTATIVE:

Mr. A. Lawrence Abel, F.R.C.S., Surgeon Cancer Hospital, London, Eng.
Prof. Mario Donati, Head of Dept. of Surgery, University of Milan, Milan, Italy.
Dr. Ferdinand Sauerbruch, Prof. and Head of the Dept. of Surgery, University of Berlin, Berlin, Germany.

HOTEL HEADQUARTERS
Benjamin Franklin

HOTEL RESERVATIONS

Hotel Committee, Dr. Edward Weiss, Chairman,
1923 Spruce Street, Philadelphia, Pa.

Final program mailed to all members of the medical profession September 15th
If you do not receive one, write the Managing-Director, Freeport, Illinois.
Comprehensive Scientific and Technical Exhibit. Special Entertainment for the Ladies.

REDUCED RAILROAD RATES
FROM ALL PARTS OF THE
UNITED STATES AND CANADA

SANATORIUM PRÉVOST Inc.

CARTIERVILLE (Montreal)

FOUNDER; THE LATE DR. ALBERT PRÉVOST

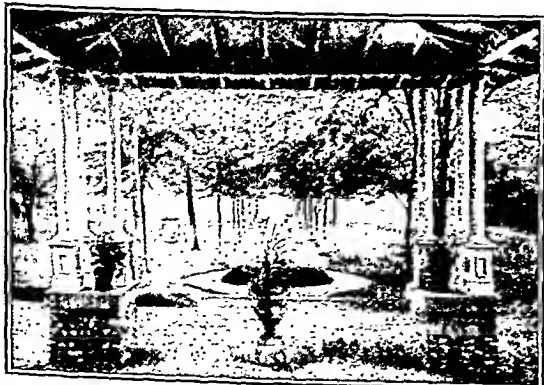
Médecin Légaliste de la Faculté de Paris

Professor of Neurology, University of Montreal

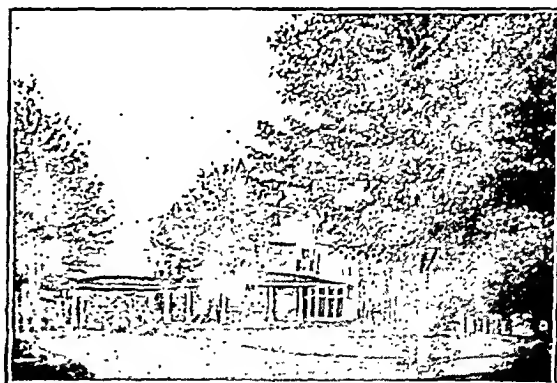
Professor of Nervous Diseases, Notre Dame Hospital, Montreal

MEDICAL DIRECTOR; DR. E. LANGLOIS

All diseases of the nervous system Convalescence, Treatment of intoxications. Diseases resulting from malnutrition.



VIEW FROM THE VERANDAH.—THE BEAUTIFUL ALLEY SHOWN
LEADS TO THE RIVER

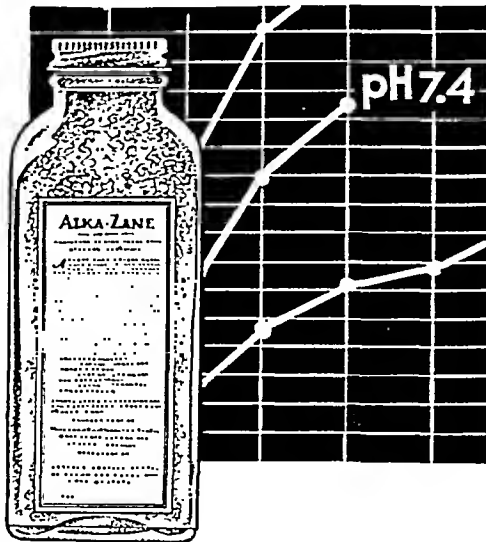


EXTERIOR VIEW — MAIN BUILDING

The Sanatorium is built on a large piece of ground 400,000 square feet, extending from Gouin Boulevard to Rivière des Prairies. Built at the centre of this private park, the two pavilions of the Sanatorium are isolated from the road and the river by two large pieces of land. Beautiful trees shade the private grounds and in every respect the sanatorium is well situated to provide that rest and quietness so necessary to the patient's cure.

Telephone: Sanatorium Prévost Bywater 3240
Dr. E. Langlois - Lanca

Prospectus sent on request



CHARTS CAN'T EXPLAIN IT

It takes personal observation in practice to evaluate properly the good effects of Alka-Zane in systemic acidosis—threatened or actually present.

The clinical thermometer will show how fever abates when Alka-Zane is an adjunct of the treatment in influenza and other febrile diseases.

The pregnant woman will curtail her story of uneasiness and discomfort, when Alka-Zane is administered during the puerperium.

Certain skin diseases will show a marked tendency to improve, when Alka-Zane supplements the treatment.

Albumin will diminish in the urine when Alka-Zane is given in nephritis.

These are just a few examples where Alka-Zane may prove of evident usefulness in the treatment of diseases in which acidosis is a complicating factor.

Trial supply sent on request. Please use letterhead.

ALKA-ZANE — *for acidosis*



Alka-Zane is supplied in bottles containing 1½ and 4 ounces. The dose is one teaspoonful in a glass of water.

Alka-Zane is an effervescent salt of the carbonates, phosphates and citrates of sodium, potassium, calcium and magnesium. It is free from lactates, sulphates and tartrates, and sodium chloride. A teaspoonful in a glass of water makes a zestful, refreshing drink.

WILLIAM R. WARNER & CO., LTD.
727 King Street, West Toronto, Ontario

ANTISEPTIC SOLUTIONS *for* MUCOUS MEMBRANES

THE antiseptic solution to be applied to a delicate membrane should preferably be non-irritating; yet it should be effective.

Neo-Silvol solutions are bland; they may be used in the eye without injuring or irritating the conjunctiva. But Neo-Silvol is an effective antiseptic agent, useful in affections of the eye, nose, throat, and genito-urinary tract.

Neo-Silvol solutions up to 50% strength may be made without difficulty, dropping the crystals into water and shaking in a stoppered bottle.

Neo-Silvol solutions are practically non-staining.

Neo-Silvol (Colloidal Silver Iodide Compound) is supplied in 1-ounce and 4-ounce bottles; also in bottles of 50 and 100 six-grain capsules.

Neo-Silvol (Colloidal Silver Iodide Compound) is accepted for N. N. R.
by the Council on Pharmacy and Chemistry of the A. M. A.

.. ♦ ♦ ♦

PARKE, DAVIS & COMPANY
WALKERVILLE, ONTARIO

Branches:

Montreal, Que. Winnipeg, Man.

DEPENDABLE MEDICATION BASED ON SCIENTIFIC RESEARCH



Recommend it* in cases of *Constipation, Stomach and Skin Disorders*

FLEISCHMANN'S YEAST is of very decided value in treating disorders which the physician has to deal with every day.

The reason Fleischmann's Yeast is so desirable in cases of constipation is that it gently stimulates peristalsis without forming a dangerous habit.

In digestive disorders, it stimulates gastric secretions and supplies vitamins B and G, so important in relation to the appetite, as well as vitamin D.

In furunculosis, acne and other common suppurative skin disorders, Fleischmann's Yeast has a very well-known effect. It has now been discovered that it has the peculiar ability actually to increase the skin's

so-called "self-disinfecting" power.

*Fleischmann's fresh Yeast is the only yeast that is rich in *three* vitamins. Advise just two cakes daily—before breakfast, and before supper or at bedtime. It may be eaten either plain, broken up in small pieces, or dissolved in water (preferably about a third of a glassful).



**SEND FOR
IMPORTANT BOOKLET**

Health Research Dept. CMA-9, Standard Brands Ltd., 802 Dominion Square Bldg., Montreal, P.Q.

Please send me revised edition of "Yeast Therapy," based on the findings of distinguished investigators.

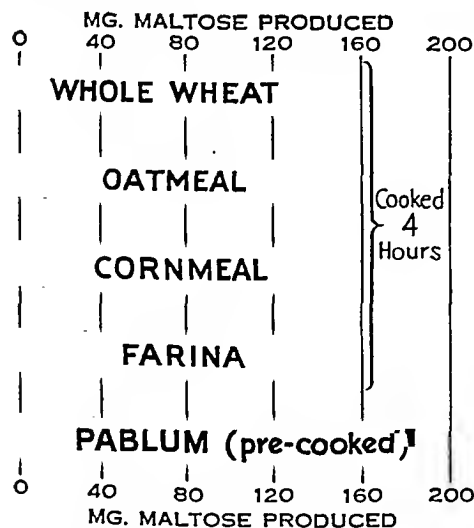
Name _____

Address _____

The cereal-starch of PABLUM is more quickly digested than that of long-cooked cereals

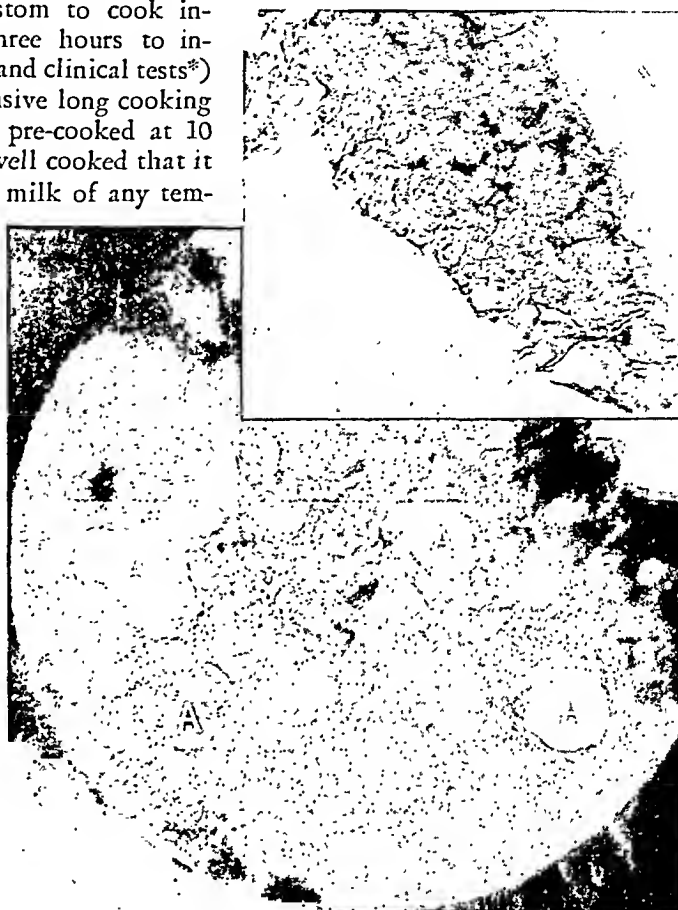
FOR many years it has been the custom to cook infants' cereals one, two, and even three hours to increase their digestibility. The microscope (and clinical tests*) now prove that this bothersome and expensive long cooking is unnecessary with Pablum. For, being pre-cooked at 10 pounds steam pressure and dried, it is so well cooked that it can be served simply by adding water or milk of any temperature. Photomicrographs and also digestibility studies *in vitro* give evidence of this thorough cooking.

Fifteen cereals (both cooked and uncooked) studied microscopically were revealed as containing many starch granules, most of them massed into dense clumps. *Such unruptured clumps were never observed in hundreds of examinations of Pablum.* The latter consists, rather, of porous flakes which, like sponges, drink up liquids. Hence Pablum can be entirely saturated by the digestive secretions. This is borne out by studies of Ross and Burrill who found that the starch of Pablum is more rapidly digested than that of ordinary cereals cooked 4 hours.



*Chart shows that maltose production is much greater for Pablum prepared with cold water than for other cereals cooked 4 hours. Ross and Burrill (Journal of Pediatrics, May 1934) conclude from this and from the total soluble carbohydrate formed that starch digestion of Pablum is more rapid than that of 6 other cereals.

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons



140 X, STAINED

(INSET) 290 X, STAINED

Large photomicrograph: Pablum mixed with cold water—portion of large flake. Pablum flakes are honeycombed with "pores" or air-spaces (note light areas A). This porosity permits ready absorption of digestive fluids by the entire flake. No starch granules are visible—they have been completely ruptured.

Inset: Farina cooked ½ hour—clump of cereal composed of unruptured starch granules. Note density of clump and lack of porosity. Many starch granules, such as are present in raw cereal, remain unchanged in form.

BESIDES being thoroughly cooked and readily digestible, Pablum supplies essential vitamins and minerals, especially vitamins A, B, E, and G, and calcium, phosphorus, iron, and copper. It is a palatable cereal consisting of wheatmeal, oatmeal, cornmeal, wheat embryo, alfalfa leaf, beef bone, brewers' yeast, and salt.

*Reprint of Ross and Burrill paper sent on request of physicians.

MEAD JOHNSON & CO. OF CANADA, LTD.
Belleville, Ontario

Either Way - brings FACE-FITNESS

Whether you shave with Williams Luxury Shaving Cream, in quick-lathering form or Glider, the new and different Brushless Shave which spreads on with the fingers, you will be equally happy. For either means lightning-fast shaves and a Fit Face afterwards . . . especially if you complete the morning's rite with a dash of tingling Aqua Velva.

Williams

**SHAVING CREAM
and
GLIDER BRUSHLESS SHAVE
AQUA VELVA—for after shaving**

All made in Canada by

The J. B. WILLIAMS CO. (Canada) Limited,
LaSalle, Montreal.

Down Bros. Ltd., the well known English manufacturers of Surgical Instruments and Hospital Equipment, have recently opened a Canadian Office and Showroom at 143 College Street, Toronto.

They have been manufacturing surgical instruments for the past sixty years and have gained their present world-wide reputation through maintaining the superior quality and high standard of workmanship of their products, and it is interesting to know that they are one of the few houses where instruments are made by hand.

More than ten years ago, Messrs. Down Bros. foresaw the present day demand for Stainless Steel Instruments and Hospital Equipment, and after much pioneer and research work, they report that they are now able to manufacture nearly 90 per cent of their products in this metal.

They have out here a very comprehensive range of surgical instruments and apparatus, including many of the most recent designs attributed to surgeons on both sides of the Atlantic. (Adv.)

In the management of the ordinary accident and wound cases local treatment generally requires a surgical dressing which, also, is an efficient antiseptic. To be an ideal antiseptic, however, it must be one which, while inhibiting the bacteria *in vivo*, will not destroy the tissues and break down their natural re-



VI-TONE answers the demand for a quickly assimilable, digestible food suitable in pre-natal, child and invalid cases. It is a rich source of minerals and proteins, and contains the sunshine vitamin "D", in addition to vitamins A, B, and G (B₂).

Free Sample on Request

VI-TONE COMPANY
HAMILTON - ONTARIO

sistance. It must be one which will nourish, support and promote the cells in their rehabilitating process while exercising their antiseptic powers.

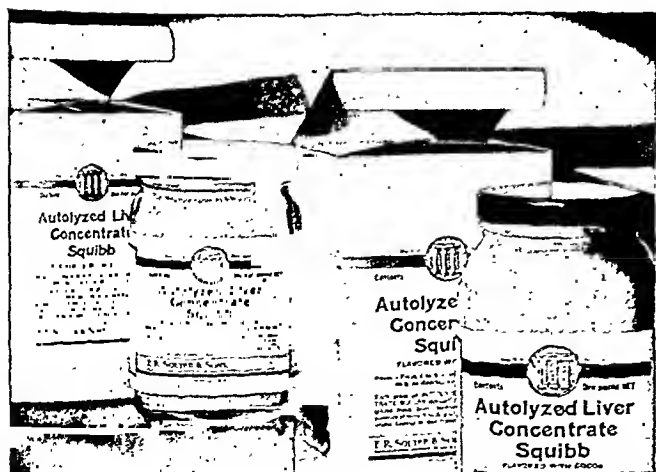
There are, of course, countless antiseptics and surgical dressings for the practitioner to select from but as an application, fulfilling the requirements of an ideal antiseptic surgical dressing, few preparations are better adapted for the purpose than is Antiphlogistine. A glance at its formula—45 per cent e.p. glycerine, boric acid, a minute quantity of salicylic acid, iodine, oils of peppermint, gaultheria and eucalyptus, blended in a base of the finest hydrated silicate of aluminum—will easily explain the reason for its efficacy in the treatment of injuries and accidents.

When applied direct to a punctured, contused, or incised wound, Antiphlogistine lessens the chances of infection. In suppurative wounds it aids in diminishing the amount of wound exudate. A spreading lymphangitis may be inhibited or diminished through its use. In cases of dislocations, sprains and synovitis it helps to relieve inflammation, swelling and pain. In burns it should be applied cold, when it favors healing, promotes growth of epithelium with a minimum of scar tissue. It is not a dressing that causes pain on application and removal, nor is there the least danger of its bleaching or macerating the skin. Soothing, decongesting and healing, it lends protection to the wound. Denver Chemical Co., New York. (Adv.)

These many advantages with **AUTOLYZED LIVER CONCENTRATE SQUIBB**

COUNCIL ACCEPTED

- A preparation of whole liver—not an extract or liver fraction.
- Twice the Vitamin B and G potency of dried yeast.
- Prompt reticulocyte response.
- A distinct rise in hemoglobin concentration.
- A marked improvement in appetite, weight, strength and neurological symptoms.
- Can be taken in a variety of ways—a distinct advantage where routine use is a necessity.
- Economical—costs only from 7 to 14 cents a day for an average uncomplicated case.



One gram of Squibb Autolyzed Liver Concentrate is equal in anti-anemic potency to from 20 to 30 grams of fresh liver. It is manufactured under license to use Patent Application Serial Number 620,301 and is marketed in ½-lb. and 1-lb. bottles.

For further information write Professional Service

E. R. Squibb & Sons of Canada Ltd.,
36 Caledonia Road, Toronto.

E. R. SQUIBB & SONS OF CANADA, Ltd.
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858.

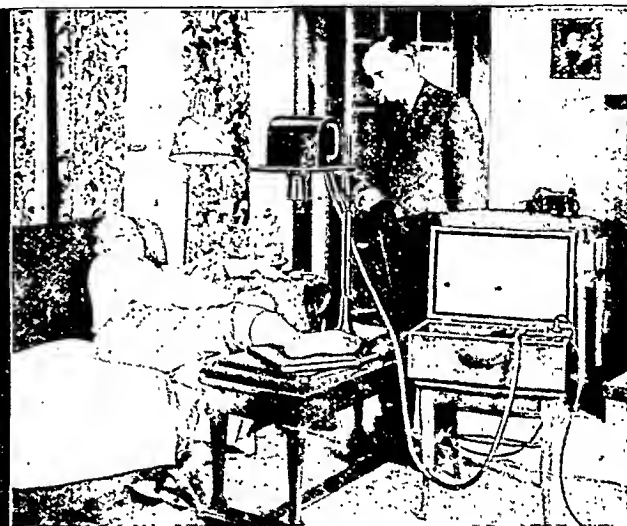


X-RAY DIAGNOSIS *in the Home*

is both practical and efficient with
the new completely oil-immersed



PORTABLE *SHOCK* PROOF UNIT



● In all our forty years' experience in the development of electro-medical apparatus, never have we witnessed a spontaneous interest equalling that which the profession has already manifested in this new portable x-ray unit.

Because it is so easily transported and readily adaptable to unusual conditions, it is the ideal emergency x-ray unit at any time and place. The fine quality of radiographic films and fluoroscopic vis-

ualization obtained with it are valuable aids to diagnosis.

As the ENTIRE high tension system, including the Coolidge x-ray tube, is immersed in oil and sealed in a single, grounded container, the unit is 100% electrically safe, and therefore without restrictions in positioning for the desired diagnostic view.

And, too, it is a highly convenient unit in the daily routine of office work.

Write for full particulars on this remarkable development

VICTOR X-RAY CORPORATION



of Canada, Ltd.



Distributors for General Electric X-Ray Corporation • TORONTO—1221 Bay St., Toronto 5, Ont. • MONTREAL—524 Medical Arts Bldg. • VANCOUVER—Motor Transportation Bldg., 570 Dunsmuir St. • WINNIPEG—Medical Arts Bldg.

A DEPENDABLE NERVE TONIC

For nerve exhaustion accompanying anxiety, overwork, excesses and debility after severe illness, Phospho-Lecithin, Wampole, is an ideal tonic for restoration of vital energy.

Each fluid ounce represents: Sodium Glycerophosphate 8 grs., Calcium Glycerophosphate 4 grs., Potassium Glycerophosphate 4 grs., Strychnine Glycerophosphate 1/60 gr., Lecithin (from eggs) 1/16 gr., Avenin 1/30 gr.

Dose - One tablespoonful four times daily, preferably before meals and before retiring.

PHOSPHO-LECITHIN, WAMPOLE

Samples for clinical trial free to physicians

HENRY K. WAMPOLE & CO. LTD.

Manufacturing Pharmacists

PERTH, ONTARIO, CANADA

Starch-free - Diabetic Foods

BREAD, BISCUITS, MUFFINS, PIE, PASTRY, DESSERTS
are easily made in any home from

Starch-Free

Listers

Self-Rising

FLOUR

Large carton LISTERS FLOUR (enough for 30 bakings), \$4.85. Small carton LISTERS FLOUR (enough for 15 bakings), \$2.75. Please ask us for the name of the nearest LISTER DEPOT or order direct from

LISTERS LIMITED - HUNTINGDON, QUEBEC

Evaporated milk *is good milk for babies*

“The average normal baby is able to assimilate unsweetened evaporated milk as well as or better than bottled cows' milk (pasteurized or boiled) during the early months of life when milk constitutes the sole food..... Similiar good results were obtained in the premature infants.” — Kositz, Lillian; *Journal of Pediatrics*, October, 1932.

Carnation Milk *is good evaporated milk*

CARNATION MILK has come to be the evaporated milk of choice with many pediatricians because of its *uniform* high quality. Scientific control of processing maintains this uniformity, which the physician finds a valuable aid in the construction of feeding formulas upon which he can depend to produce consistent results.

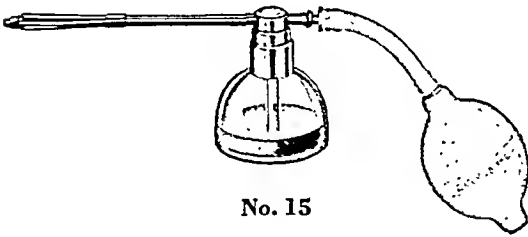


From
Contented
Cows

Send for "A Successful Infant Food," written for physicians by a pediatrician of wide experience. Address Carnation Company, Limited, Toronto, Ont.

A CANADIAN
PRODUCT

Proper Application is Necessary to Success



No. 15

When you prescribe solutions for the treatment of nose and throat infections, be sure to specify the proper application; otherwise the fullest efficacy is lost. The atomizer thoroughly covers the most remote regions of the nose and throat by diffusing the medicament into thousands of microscopic particles. The new nasal guard, recently developed by DeVilbiss, eliminates any possibility of excess pressure during self-treatment and thus guarantees safety of application. In addition, the atomizer is economical, for where used there is no waste from excess application. Finally, quality construction insures long life even when constantly in service.

DeVilbiss

The DeVilbiss Mfg. Co., Limited, Windsor, Ontario,
headquarters for atomizers and vaporizers
for professional and home use

• Palatable . . . and non - irritating . . . in the treatment of coughs . . . grippe . . . and bronchitis

There is never any reluctance on the part of children or adults in taking Liquid Peptonoids with Creosote. It is palatable, non-irritating and can be retained by the most sensitive stomach. Clinical test will prove the value of this product as a bronchial expectorant and sedative. The coupon will bring samples and literature.

Liquid Peptonoids with Creosote

THE ARLINGTON
CHEMICAL CO.
YONKERS, NEW YORK



W. LLOYD WOOD, LIMITED,
Canadian Agent,
64-66 Gerrard St. E., Toronto C.M.J. 9-34
You may send me at the address below
a sample of Liquid Peptonoids with Creosote.

Dr. _____

Address _____

City _____ Prov. _____

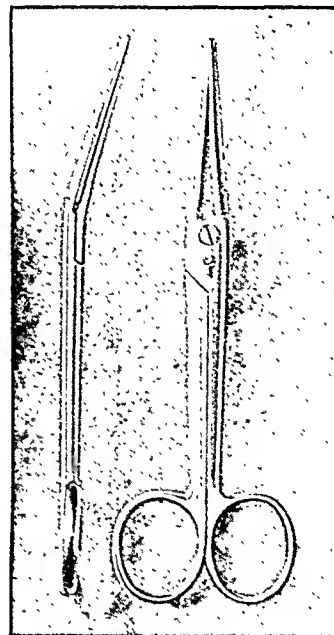


SCISSOR RESHARPENING ELIMINATED

To both the surgeon and the hospital Bard-Parker Renewable Edge scissors offer distinct advantages. Renewable edge scissors require no regrinding and are superior to resharpened scissors. Used edges may be quickly replaced with new uniformly sharp edges at the small cost of $18\frac{1}{2}$ cents per pair. Since these scissors are not subject to grinding wear they far outlast the conventional types.

Bard-Parker Renewable Edge scissors, *stainless steel*, are available in operating and dissecting types ranging in price from \$3.15 to \$4.70 per pair. Renewable Edges for all types 55 cents per package of 3 pairs. Your dealer will be glad to give you a demonstration.

BARD-PARKER COMPANY, INC.
DANBURY, CONN.



6 $\frac{3}{4}$ " Dissecting offset with renewable edges. Possesses the operating visibility of the curved scissor with superior cutting qualities. Price, \$4.70

A BARD-PARKER PRODUCT

ERGOAPIOL (SMITH)



Amenorrhea - Dysmenorrhea Menorrhagia - Menopause

Today, as for years, Ergoapiol (Smith) is the accepted medicament in combating those menstrual anomalies which may be traced to constitutional disturbances; atonicity of the reproductive organs; inflammatory conditions of the uterus or its appendages; mental emotion or exposure to the elements.

The physician readily can ascertain whether his prescription for Ergoapiol (Smith) has been correctly filled by dividing the capsule at the seam, thus revealing the initials M. H. S. embossed on the inner surface, as shown in photographic enlargement.

Literature on request.

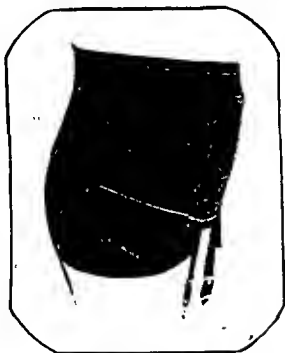
MARTIN H. SMITH CO. ··· 150 LAFAYETTE ST. ··· NEW YORK CITY

Trademark
Registered

STORM

Trademark
Registered

Binder and Abdominal Supporter



Gives perfect uplift. Is worn with comfort and satisfaction. Made of Cotton, Linen and Silk. Washable as underwear. Booklet shows three different "types" and many variations of each.

Picture Shows "Type N"

For Ptosis, Hernia, Pregnancy, Obesity, Relaxed Sacroiliac Articulations, High and Low Operations, etc.

Each Belt Made to Order.

Ask for Literature

Katherine L. Storm, M. D.

Originator, Owner and Maker

1701 Diamond Street

Philadelphia, Pa., U.S.A.

SAL HEPATICA

A Carefully Blended and Well-Balanced Effervescent Saline Combination.

Materially aids in the correction of alimentary toxemias by thoroughly cleaning the intestinal canal.

Laxative or active cathartic according to dosage.

Samples for clinical trial

BRISTOL-MYERS COMPANY

75 West Street,
New York



**F. & R.'s
GENUINE
GLUTEN FLOUR**



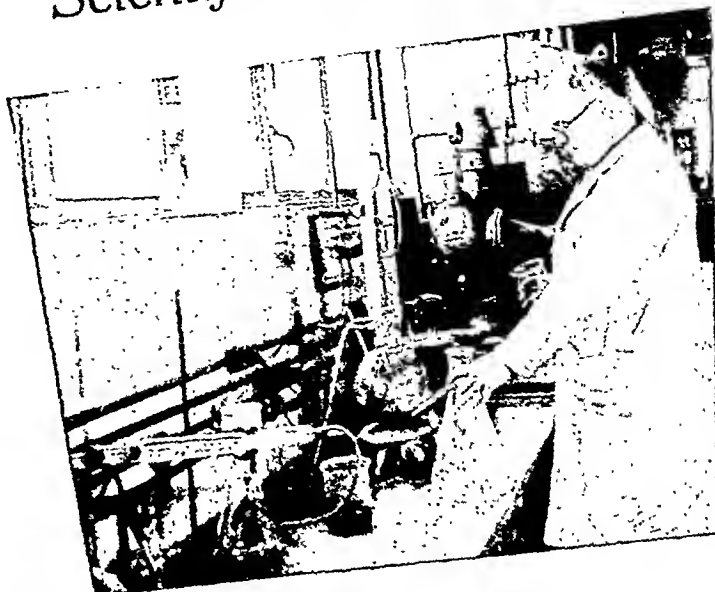
Guaranteed to comply in all respects to standard requirements of the U.S. Department of Agriculture.



Manufactured by
THE FARWELL & RHINES CO.
Watertown, N.Y., U.S.A.



Years of Scientific Research



DERMAL THERAPY MODERNIZED
COMPLETE RAPID ABSORPTION
IMMEDIATE PRURITIC RELIEF
EASE OF APPLICATION
POSITIVE RESULTS
NO BANDAGING

were necessary to perfect

MAZON FOR ECZEMA

INDICATIONS:

ECZEMA
PSORIASIS
ALOPECIA
RING WORM
DANDRUFF
ATHLETIC FOOT
AND OTHER SKIN
DISORDERS

Mazon (colloidal) is a combination of Phenolic substances and Dichloramine-T in an absorbent base.

MAZON SOAP

is soothing and inoffensive to the skin.
It contains none of the usual irritating perfumes or artificial coloring.
MAZON AND MAZON SOAP
MUST BE USED ALONE.

REFUSE SUBSTITUTES

Insist that your patient obtain the original 1-2-4 ounce blue jar.

On Sale
at dependable pharmacies

Distributed by
reputable wholesale druggists

Made in Canada:
LAURENTIAN LABS.
LIMITED
Montreal - Que.

Mazon was perfected in 1921 by a Pharmaceutical chemist, after years of extensive scientific research and clinical experiments.

The original formula for Mazon has never been changed. Mazon is compounded by its originator and every detail of manufacture is under his personal supervision;

guaranteeing the physician a local dermal treatment whose consistency and uniformity is backed by the integrity of its manufacturer.

Permanency of results obtained with Mazon offers an effective and economical treatment.

Equally effective in both adult and infantile cases.

Literature and Samples on request

BELMONT LABORATORIES, Inc., C-24
4430 Chestnut St., Philadelphia, Pa.

Gentlemen: Please send me trial supply of Mazon and Mazon Soap.

Dr. _____
Address _____
City _____ Prov. _____

INFECTED WOUNDS

As a surgical dressing for the majority of infected wounds, or those potentially infected by reason of the entrance of foreign matter, Antiphlogistine dressings are of recognized value.

One of the disadvantages of the ordinary wet dressing is its tendency to bleach and macerate the skin.

Under the influence of an Antiphlogistine dressing the skin surface is kept moist and normal, bleaching is avoided and the wound is encouraged to heal.

Antiphlogistine is an antiseptic dressing of just sufficient strength to assist in the regeneration of the tissues without causing their destruction.

ANTIPHLOGISTINE

(Contains 45% c. p. glycerine, boric and salicylic acids, compounds of iodine, oils of gaultheria, eucalyptus and peppermint, blended in a base of the finest anhydrous silicate of aluminum.)

Sample and literature on request

THE DENVER CHEMICAL MFG. CO.

153 Lagauchetiere St. W., Montreal



Made in Canada

"THOROUGHLY RELIABLE"

—that's the verdict of doctors who are prescribing

AYLMER INFANTS FOOD



Rigid testing in the AYLMEER Research Laboratory is but one of several steps taken to maintain uniform excellence!

ELEVEN VARIETIES

—all finely strained and packed in sterile tins.

Spinach	Infants' Soup
Carrots	Beans
Asparagus	Beets
Tomatoes	Prunes
Peas	Apricots

Apple Sauce

Samples for examination will be supplied on request.

WHEN you prescribe AYLMEER Infants Foods (strained fruits and vegetables) you can do so with the utmost confidence. The formulæ have been carefully worked out by the AYLMEER Research Laboratory in collaboration with Baby Specialists.

A scientifically equipped plant makes it possible to follow these formulæ without deviation. Production is carried on under the direct supervision of qualified chemists. Every possible precaution is taken to assure a product that is thoroughly reliable and offering the full food values natural to fresh fruits and vegetables.

CANADIAN CANNERS LIMITED, HAMILTON, CANADA

